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Frontispiece
Annals of Medical History
January, 1935

"Office of Nurses"
On the Left a Meneur with His Charges

[From Petrus Franciscus Phrygius: Commentarii. Lugduni, 1644.]

ANNALS OF MEDICAL HISTORY

New Series, Volume VII January, 1935 Number 1

WILLIAM WOOD GERHARD*

By WILLIAM S. MIDDLETON, M.D.

MADISON, WIS.

Note: Sincere appreciation of the assistance of Drs. William Snow Miller and William Pepper is herewith expressed. Dr. Arthur Howell Gerhard also gave material aid and encouragement in the preparation of this biographic note of his kinsman.

OF William Wood Gerhard a contemporary said:

> No man of his day enjoyed so high a reputation as a clinical teacher, and not only did he succeed in an eminent degree in arousing the enthusiasm of students and putting them in sympathy with himself, by infusing into them his own ardour in his favorite study; but he produced an influence upon the profession here, which is felt still, which has fostered the establishment of clinical teaching among us, and done much to give it that rank which it now occupies here as a branch of medical instruction.

In 1840 a class at the University of Pennsylvania expressed its appreciation of his efforts in its behalf by a formal vote of thanks. And yet, a careful search of the faculty records of that period establishes the fact that William Wood Gerhard never occupied a major chair in that august institution nor in its bustling rival, Jefferson Medical College, then in its swaddling clothes. Academic station is no measure of professional prominence in medicine. Yet the paradox of Gerhard's assured position through the medium of teaching without the station of a professorship in a medical school will immediately arrest the attention of the most casual student of Philadelphia medicine. He was in truth a medical minister without portfolio.

William Wood Gerhard was born in Philadelphia, July 23, 1809. He came of excellent stock from both sides of the family. His great grandfather, Frederick Gerhard, had emigrated from Hesse Darmstadt in 1737 to settle in Berks County, Pennsylvania. Shortly thereafter (1745) it is recorded that this forebear changed his allegiance from the German Reformed to the Moravian Church. The grandfather of William Wood Gerhard, Conrad by name, came to

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* Read before the Medical History Seminar, University of Wisconsin.

Philadelphia where his son, William, was born in 1774. Here William Gerhard and Sarah Wood, William Wood Gerhard's parents, were married in 1808. Sarah Wood's home had been in Salem County, New Jersey, and her family had arisen from Anglo-Saxon and north Irish roots. They, too, were Moravians in creed.

The earliest picture of William Wood Gerhard drawn from family tradition depicts the lad perched on a top shelf in an unoccupied room of the house, too engrossed in his reading to notice the passage of time and the importunate dinner-bell. A favorite posture in devouring heavier tomes is ascribed to him. Such volumes would be supported on a sofa while the boy read from a lower chair drawn in front of the same. Industry and close application marked the young Gerhard's work at Dickinson College which he entered in 1823. His academic course was completed in 1826.

Thereupon he placed himself under the preceptorship of Doctor Joseph Parrish, one of the dominant practitioners in Philadelphia at that time, of whom Caspar Wistar had said, "[He] had the ambition of a Bonaparte and the benevolence of a Howard." While he never held a chair in the medical schools, his private school rivalled in strength of faculty and attendance that of Nathaniel Chapman whose prestige as a professor of the practice of medicine at the University would naturally have attracted a considerable following. This pernicious system of private instruction which threatened from time to time to disrupt the legitimate schools of medicine, served one laudable purpose in supplementing the regular courses which then lasted only four months.

In the Library of the College of Physicians of Philadelphia among other interesting Gerhard items is his notebook of Parrish's lectures. It is remarked that the lectures of 1828 duplicated those of 1827. Apparently an acute student of disease, Parrish interspersed his lectures with citations of personal experience. His views upon subjects of medical debate were decided. In discussing autumnal fever he said:

> Marsh exhalations are the usual causes of fevers. From this circumstance important cautions may often be derived. Thus the vast body of marshy land on the western border of the Schuylkill gives rise to a vast body of miasma which passes up the valley of the Schuylkill, passes downwards to the Delaware, along Turner's Lane and the adjacent park; hence these situations are much exposed to disease.

Nor were medical traditions and personalities sacred to Parrish. Of the reputed tendency of yellow fever to recur, he said, "Dr. Physick thinks he has had the fever several times; I do not question his opinion, but it must have been a very accommodating fever." Not willing to abide by his own opinion in the matter he continued:

> My friend, the late Dr. Samuel Powel Griffiths, who had practiced in the midst of yellow fever perhaps more than any man in the city; had remained firmly in '93 and every successive year, told me that he would not undertake to say that he had never seen a second attack; but he would positively assert that he had never seen a death from a second attack.

The University faculty was unusually strong at this period. Nathaniel Chapman was professor of the practice of medicine and clinical medicine.

Gifted and brilliant as a clinician and teacher, his luster was in a measure dimmed by his persistent recourse to political manipulations to attain his ends, personal or otherwise. William Gibson gave further fame to the chair of surgery, vacated by Philip Syng Physick in the readjustment of the faculty subsequent to the death of his nephew, John Syng Dorsey. The crafty hand of Chapman is apparent in the transfer of Gibson, which materially weakened the faculty of Maryland. Physick, however, was by this time inactive in the actual teaching of anatomy and most of the burden fell upon his willing assistant, William Edmonds Horner. Whatever may be the reservations of posterity Horner was an anatomist of first rank and a pioneer in pathologic histology whose observations upon the dejecta of cholera constitute a landmark in the study of that disease. Thomas Chalkley James and William Potts Dewees shared the responsibility for the teaching of obstetrics and their fame is brief for the adequacy of their instruction. The obstetrical department of the Pennsylvania Hospital had been established in 1807 from the generous donation of the Revolutionary War pay of the members of the First Troop of City Cavalry. James was accoucheur to the Hospital until 1832 and here gave medical students their instruction in midwifery. John Redman Coxe was professor of materia medica and pharmacy. A grandson of the venerable John Redman, he was criticized for his too close adherence to the precepts of the ancient fathers of medicine. In the light of subsequent events his teaching was probably the soundest of the group; but he is best known for his activities in medical compilation. Robert Hare was professor of chemistry and is famed for his oxy-hydrogen blowpipe.

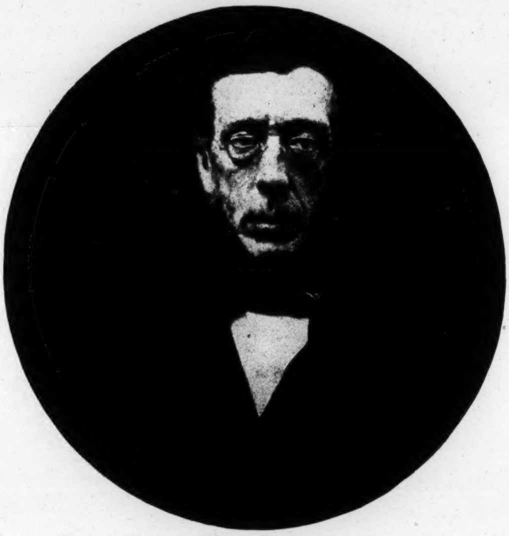


FIG. 1. WILLIAM WOOD GERHARD (1809–1872).

Examples of Gerhard's classroom notes are ample to indicate the trend of medicine of the day. Coxe lectured to them regarding venesection in the following words:

> Blood-Letting. Most important evacuant. Though a negative article, positive in its effects, and more immediate in its consequences. Most effectual sedative, sometimes a stimulant. One of the most ancient remedies. It has maintained its character amid the fluctuations of medical doctrines. Some were accustomed to bleed at particular seasons, times of the day, aspects of the moon, etc. Much prejudice has existed against blood letting in infancy and old age. Abstinence produces effects analogous to blood letting; a certain quantity of matter is carried off from the body; and unless the supply be daily renewed, a deficiency in the quantity of the circulatory fluid must take place. . . . In epidemic of 1793 I saw utility of blood-letting. In Cynanche Parotidea prevents its effects. Blood-letting should be cautiously employed in pneumonia.

Coxe's dissertation upon blood-letting was concluded by a most judicious consideration of indications and contraindications.

The discussion of constipation by Coxe is noteworthy if only for the inclusion of the following observation:

> In spasmodic costiveness, opium acts as a purgative, by relaxing the spasmodic contraction. In fevers cathartics have long been administered. Purgation in fevers is sometimes carried too far. . . .
>
> Regular visit to the temple of Cloacina is the best remedy for costiveness.

The orderly notes of young Gerhard clearly forecast his future lucidity of style and thought. His industry of undergraduate days was carried to the medical school and summer courses in Parrish's private school were regularly attended.

Of the faculty of medicine at Pennsylvania the individual who seems to have wielded the greatest influence over the young students of that period, was Samuel Jackson, then an assistant to Professor Chapman with the responsibility of teaching the institutes of medicine. Yet his colorful, dynamic personality overshadowed his superiors and associates, and his intense interest in the revolutionary methods of the French school was a source of sustained inspiration to his students. Jackson never permitted his enthusiasm to befog the issue where principles of practice were concerned. Accordingly it is not surprising to find him eventually turning from an early allegiance to Broussais to accept the coolly logical precepts of Louis. To this master he sent such promising students as Gerhard, Pennock, Clymer and Stillé.

William Wood Gerhard graduated from the University of Pennsylvania in 1830. His thesis confirmed Lembert's observation upon the endermic application of drugs. It is interesting that Gerhard served as a resident at the Philadelphia Almshouse for some time prior to his graduation and it may be inferred that his studies were made upon patients at this institution. His careful analysis of the results showed an unusual maturity of thought and judgment. He continued his residency at the Philadelphia Almshouse after graduation.

In the spring of 1831 Gerhard left for Paris on the advice of Samuel Jackson. Apparently the latter's favorable references to Broussais in the classroom had not prepared Gerhard for the decline in which the latter found the old favorite of French medical students. His benches were either vacant or in the process of being filled at the end of the session for the succeeding lecturer. Gerhard wrote, "Broussais is the best known, his reputation is universal and the benefits he has conferred on medicine are immense, but unfortunately he is a wretched lecturer. His own opinions are given in the most awkward, clumsy manner; the manner and style of lecturing are coarse and vulgar." The true explanation for Gerhard's obvious lack of interest in Broussais was not one of personality but of substance. The crux is to be found in one of a series of letters from Gerhard to kinsfolk during his Paris stay, which have been preserved in Osler's charming essay upon "The Influence of Louis on American Medicine":

> Dr. Louis is delivering an interesting clinic at La Pitié; he is a remarkable man, very different from the physicians of England or America and remarkable even at Paris by the strict mathematical accuracy with which he arrives at his results; he is not a brilliant man, not of the same grade of intellect as his colleague at La Pitié, Andral.

The French language offered no difficulty to Gerhard, since custom had made it the household medium in his family. The days in Paris were crowded and a rigid schedule insured every advantage to the American student. Osler again has preserved the record of this plan in one of Gerhard's letters:

> The morning from seven to ten is occupied with the visit and clinic at the hospital; there are several distinct clinics now in actual progress; each of them has its advantages. I shall vary my attendance at the different hospitals and select those lecturers who are of real merit. At this moment we are following Piorry at the Salpétrière, a very distant hospital two or three miles from our own lodgings; his patients are all old women, and not interesting. My object in following his course is to obtain some interesting information on the best mode of investigating the diseases of the chest. M. Piorry has devoted special attention to this subject. From Salpétrière we hurry to La Pitié; we hear a surgical lecture, reach home to breakfast, and then to the school of medicine. The lectures at the school, with a private course of anatomy during the hour of intermission, fill up the remainder of the day until four. Fortunately a private clinic at La Charité introduces me to a set of very interesting cases, especially of pectoral cases. Dr. Dagneau has a class who pay him ten

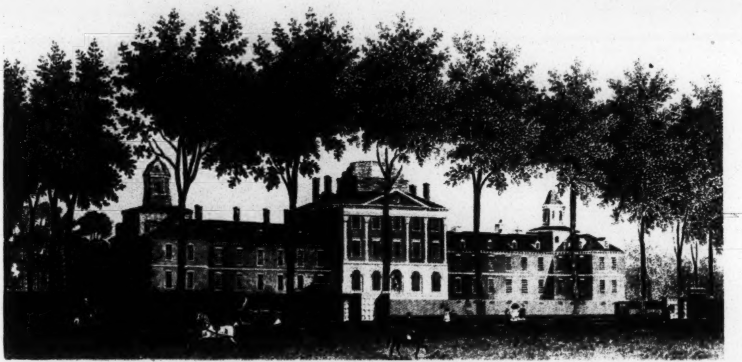


Fig. 2. Pennsylvania Hospital.

francs a month and enjoy the privilege of examining the patients much more conveniently than is practicable during the morning visit in the midst of a crowd of students. We dine at five-thirty and then lectures again until eight o'clock. Imagine the facilities, the delightful advantage of acquiring positive information and what is at least as important, of learning the mode of obtaining these positive results.

In addition to his fellow townsman, Caspar W. Pennock, Gerhard was on particularly intimate terms with James Jackson, Junior, of Boston during the Paris stay. Since Jackson was a favorite student of Louis, this friendship doubtless facilitated the following unusual arrangement recounted in a letter to his brother under the date of February 3, 1832:

> I must write you at least a few days before the excitement has passed off; can you imagine how fortunate I am—devinez si vous prouvez—two or three days ago, Jackson, Pennock and myself were talking of hospitals and morbid anatomy, when the idea occurred of attempting the study of pathology in a particular manner. It was this: to obtain the specimens and study them, the authors in our hands, exactly and carefully comparing authorities with the subject before us. We addressed ourselves to two of the internes at La Pitié attached to the salles of Louis and Andral, and they agree to procure all the facilities in their power and communicate their own information for the compensation of 60 francs from each of us; we accordingly visit La Pitié on three afternoons of the week and examine the parts at the hospital, afterwards carrying home such portions as require minute investigation. Our first success in this opening of new sources of instruction emboldened us to attempt something of higher importance. We were all desirous of studying auscultation, of studying it in such a manner as to be sure of our ground on our return, and to be capable of appreciating the advantages of the art. Louis' public instructions were valuable, but his private lessions upon a subject demanding minute and patient inquiry we knew would be infinitely more so. I, therefore, in the name of my friends addressed him a polite note, accompanied by a handsome pecuniary offer; we did this with little hopes of success, but happily for us he accepted our proposition, and next week we are his private pupils at La Pitié. We are, I believe, the first who have made this arrangement with M. Louis, and you may estimate its importance when I tell you that he is considered in excellence of diagnosis a successor of Laennec. Our advantages for the study of pathology and the diagnoses of diseases of the chest are now superior: they are indeed the very best in the world, and our eagerness to embrace them will, I hope, render them of real utility; of course they involve an additional expenditure of 400 to 500 fr., but I should be happy to shorten my stay at Paris a month to improve the remainder of my time in this manner, if such were necessary for me.

Louis' influence upon many of his American students became apparent before they left Paris. Gerhard carefully recorded his clinical observations in a journal which is preserved in the College of Physicians of Philadelphia. In 1832 he published a paper in conjunction with Pennock on Asiatic cholera. References are repeatedly found in this period to the activities of the Société Médicale d'Observation, to the proceedings of which a number of the American students contributed while in Paris. The spell of Louis' teaching was strong upon them and their reports not only in Paris but after their return to America bore its stamp in the meticulous detail of their observations and the dispassionate subscription to fact. Further occasion will be taken to trace this influence in Gerhard's subsequent career. Apparently he visited Great Britain prior to his return to Philadelphia, late in 1833, for later reference was made to his opportunity to observe typhus fever in Edinburgh.

The early months of Gerhard's professional career were utilized in assimilating much of the unorganized material of his Paris days. Before entering upon a consideration of this phase of his development, a glance at his habit of study may not be amiss. Without cant or assumption of superiority Gerhard thus outlined his plan of attack in a dissertation upon "Cerebral Affections of Children" in the *American Journal of the Medical Sciences* for February, 1834:

> This little personal experience will be perhaps partially compensated by the absence of all preconceived notions as to the nature, relative importance of symptoms or frequency of lesions in these cases. . . . I have avoided examining the works upon these affections and have even abstained from comparing my own observations with each other, believing that during a series of observations I should pursue the safer course to avoid all risk of forming a premature opinion upon a subject still intricate and obscure. These precautions may appear trivial, but such as are most familiar with the difficulties of observation will readily perceive the danger of theoretical opinions, and understand the utility of extreme caution in avoiding all suggestions which might give a false colouring to a course of observations in actual progress; as soon as the series is complete, the examination of the facts related by others is both appropriate and necessary. Such a method of study seems to be the only means of arriving at truths, which, subsequent experience will confirm, instead of the vague notions shown by one author and rejected by his successor as false and untenable. The phenomena of disease are like the facts of the natural sciences subject to laws, pursue a regular march, and tend towards a natural termination by the recovery or death of the individual. The important difference, however, between medicine and the study of the ordinary phenomena of nature, is that we have an infinitely more complicated science, demanding a greater variety of knowledge, requiring the consideration of a multitude of external agents which modify the usual phenomena and from the nature of the object, a thinking active being, obliging us to confine our means of investigation to a narrow limit. These difficulties render rigorous observation more painful, but more necessary, and show the futility of theories and vague notions in a science which requires a more careful study of facts than any other; a chemist performs his experiments and states his deductions, but physicians too often form their theory and afterwards search for facts to sustain it. In short, few questions can be resolved without a direct appeal to nature; and it is only from facts well established and carefully analyzed that uncontested truths can be deduced. I have thought it due to the reader to explain the methods of study pursued, and to state my firm conviction that no other means are capable of establishing what is positive in medicine than the simple observation and comparison of facts. A large portion of the medical world is not yet convinced of the practicability of this sort of investigation, and some physicians affect to disdain these painful researches, and imagine that it is the part of a humble order of intellect to be confined to the naked facts instead of indulging in those vast combinations which indicate a superior mind. But as the object principally to be attained in every scientific research is the discovery of truth, and not the gratification of individual vanity, the means to be pursued in the investigation are such as lead most surely to this end, and the physician who has courage sufficient to devote him-

> self first to the rigid proof of the existence of the phenomena, and who will afterwards investigate their relations and seek to interpret the facts, pursues a more logical and useful course than he who discovers, or imagines that he has discovered an isolated cause with which he seeks to establish the connexion of the numerous facts that he witnesses.

The ensuing application of this thesis by Gerhard constitutes the first comprehensive picture of tuberculous meningitis in the literature. Indeed, its detailed clinical and pathologic notes may be read with profit by modern students of this condition. The observations were made in the Hôpital des Enfans Malades and included certain cases reported by himself and friends before the Société Médicale d'Observation. The bedside notes were cryptic but decisive; for example:

> Skeleton well formed; moderate embonpoint; complexion sallow; decubitus variable; vague unmeaning movements of the arms; stupor, accompanied agitation, and frequently delirium characterized by unmeaning cries and words; insomnia nearly complete; frequent sighing and cries, but not apparently indicative of pain. He understands questions in a loud tone, and answers correctly but the delirium is only momentarily interrupted; frontal cephalalgia; sight troubled; eyes dull, half-closed, but pupils contractile, not dilated, of natural appearance; no strabismus; hearing imperfect, with tinnitus aurium; sensibility and movements of all limbs natural; face not distorted; heat moderate but dry; neither sudamina nor typhoid spots on the skin; tongue brownish, a little dry; teeth fuliginous, mouth remains half opened; abdomen retracted, presenting nothing in the exterior but leech bites, some of which are in suppuration; pulse 80, a little irregular; respirations very irregular, alternately very frequent or slow; percussion of the chest sonorous anteriorly; respiration pure.

The pathologic notes were more detailed and an analysis of each case on a clinico-pathologic basis was attempted. The following quotation is taken from the summary of Observation. II:

> It is relative to a scrofulous child who had not perfectly recovered his health, and besides the unfavourable circumstances of a damp, gloomy lodge and the nearly absolute privations of exercise to which a large number of the children of porter's are condemned at Paris, he was obliged to undergo unusual fatigue in nursing his mother. The affection offered three distinct periods, the first characterized by vomiting which lasted two days, dizziness, somnolency, sensibility of the eyes, frontal cephalalgia, these symptoms diminished perhaps partly from the effects of the depletion. The second period, we remark return, and augmentation of the cephalalgia, especially on the right side; the cerebral functions are not more affected than in the first period, there is neither delirium nor alteration of the sensibility or motility; the third period was announced by the loss of consciousness, and the paralysis of sensibility of the upper extremities, with contraction of the left side and complete relaxation of the right. The whole duration of the disease was eighteen days, the complications were slight and confined to a little diarrhoea. The anatomical lesions consisted in the infiltration of purulent matter at the base of the brain, but not considerable effusion into the ventricles; the cerebral substance was softened in a limited extent, near the surface, and also the central part of the brain, but the nature of the latter lesion is not yet satisfactorily known, and certainly in the present case, in which the autopsy was made a considerable time after death, might have existed independently of any cerebral affection. The

thorax presented nothing but some cretaceous matter in one of the bronchial glands, a fact insignificant in itself, but highly interesting when viewed in connexion with the scrofula with which the patient had been affected. The bronchial glands in children frequently present the tuberculous degeneration without traces of it elsewhere, a circumstance not observed in adults; attention should be turned towards these glands at all the periods of life, as the history of their lesions may aid in clearing the important question of the cure of tubercles. The abdominal viscera offered nothing remarkable. The treatment was equally unsuccessful in this case as in those which follow.

The *American Journal of the Medical Sciences* was the medium for his earlier American publications which included an analysis of fatal cases of rubeola observed at the Hopital des Enfans Malades and a more formal consideration of the pneumonia of children together with isolated clinical reports. Not only were the early days upon his return to Philadelphia occupied with such literary tasks, but prior to his arrival overtures had been made by Gerhard for a position on the resident staff at the Pennsylvania Hospital, to which he was elected in the spring of 1834. For the next two years its wards afforded him ample clinical opportunity to apply Louis' methods. In 1836 he reported several cases of "spotted" fever; but the lack of necropsy opportunity probably denied him the distinction of priority in the definition of cerebrospinal meningitis. Apparently he was particularly interested in the prevalent continued fever which he identified as the typhoid fever of his French masters. In applying the numerical method of Louis the coincidence of clinical and pathologic findings proved complete. Naturally the intestinal lesions of this condition arrested his attention and afforded the basis for his most conspicuous effort in the differentiation of typhoid and typhus fevers.

The opportunity for this surpassing clinical study was forthcoming through the opening of the new Almshouse across the Schuylkill River. The Spruce Street refuge for the sick and indigent had been abandoned in 1834. At first the clinical advantages of this great institution had seemed lost by reason of the prohibitive distance from the medical schools in the heart of the city to the new location in Blockley Township. However, neither Jefferson Medical College nor the University was willing to forego the teaching privilege of the ward services; hence omnibus lines were established to make regular trips between the medical schools and the new Almshouse. The Market Street Bridge was the closest vehicular span over the Schuylkill. The South Street Ferry was not so frequently utilized by the omnibuses; but undoubtedly some of the more restive students availed themselves of this ferry which crossed the river a short distance from the institution. Certainly the walk of three miles to the heart of the old city would not have deterred the sturdy. Then, too, botany was a required study in that period and the proximity of Bartram's garden to the Almshouse undoubtedly lured many students to that charmed spot.

In any event Gerhard was elected to the staff of the Philadelphia Almshouse in 1835, and with Caspar Pennock suggested the designation of a portion of the same as a hospital. Mr. Hansel, a member of the Board of Guardians, formally proposed the

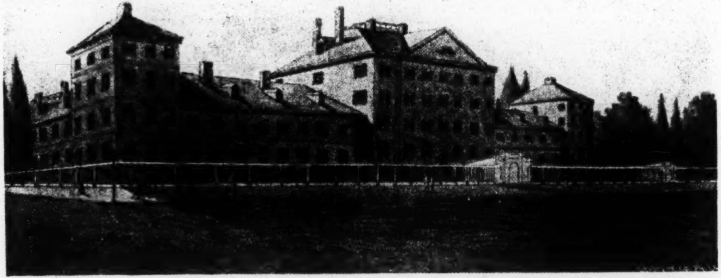


FIG. 3. PHILADELPHIA ALMSHOUSE, 1767–1834.

name, The Philadelphia Hospital; but Blockley and the Almshouse were tenacious synonyms to generations of Philadelphians. To this institution Gerhard brought the fine clinical discrimination which had lifted French medicine to its lofty plane and a zest for study which was foreordained to success. At the Pennsylvania Hospital, as previously remarked, he had had ample opportunity to correlate the clinical and the pathologic lesions of the common continued fever with the picture of typhoid fever as learned under the master Louis. Then an outbreak of typhus fever at Blockley, studied with Caspar Pennock and his resident physician, Alfred Stillé, emphatically impressed the distinction between the two diseases. Stillé presented their conclusions before the Société Médicale d'Observation of Paris, September 14 and 28, 1838; but this paper was not published until 1904 when at Osler's insistence, William Pepper translated it. The following quotation from Stille's paper has real historic value:

> The year 1836 is memorable for an epidemic of typhus (t. petechialis) which prevailed in the district of the city which is the usual seat of epidemics caused or aggravated by crowding, viz., south of Spruce and between Fourth and Tenth streets. A great many of the poor creatures living in that overcrowded region and who were attacked with typhus were brought to Philadelphia Hospital, where I had charge of one of the wards assigned to them. I had the great good fortune to study these cases under Dr. Gerhard. His permanent reputation rests upon the papers published by him in Hay's Journal, in which he fully established the essential differences between this disease and typhoid fever. All the original material he obtained in this country for determining the symptomatology of typhus was gathered by him during this epidemic; but his first studies of the disease had been made in Great Britain.

The previous contact with typhus fever in Edinburgh had apparently prepared Gerhard's mind, and this epidemic of 214 cases crystallized the matter beyond peradventure. The steps by which he evolved his ultimate conclusion were regular and logical. Of course he started with the background of a clear conception of typhoid fever based on Louis's contributions and his own widening experience in the recognition of this condition. He stated in his first communication of February, 1837 in the *American Journal of the Medical Sciences* that "assuming this disease as the basis of our investigations, one great point is gained, and much greater certainty can be given to our ulterior researches, if we compare the symptoms of any fever which is little known and imperfectly described with those of the typhoid fever, or dothienenteritis, as it is now frequently called for its anatomical lesion." By the numerical method Gerhard established the points of symptomatic and clinical dissimilarity between the two conditions. He commented on the confusion existing in the British Isles because the enteric lesions of typhoid fever were considered as a complication of typhus fever. He continued:

> In this large number of autopsies, amounting to about fifty, there was but in one case, and that doubtful in its diagnosis, the slightest deviation from the natural appearance of the glands of Peyer. . . . In all other cases, the glands of Peyer were remarkably healthy in this disease, as was the surrounding mucous membrane, which was much more free from vascular injection than it is in cases of various diseases not originally affecting the small intestines.
>
> The mesenteric glands were always found of the normal size, varying, as in health, from the size of a small grain of maize to three or four times these dimensions. With the exception of a slightly livid tint, common to them and the rest of the tissues, they offered nothing peculiar either in consistency or colour.
>
> The spleen was of the normal aspect, in one half the cases, in the other half it was softened, but not enlarged, and in one case out of five or six, enlarged and softened.
>
> Thus, the triple lesion of the glands of Peyer, mesenteric glands and spleen, constituting the anatomical characteristic of the dothienenteritis or typhoid fever, although sought for with the greatest care, evidently did not exist in the epidemic typhus.
>
> Although in some respects, the two affections are analogous, and even similar the radical difference of anatomical lesions is at least as well marked as the distinction between the symptoms.

Gerhard's work received immediate recognition. After its appearance in two sections in the *American Journal of the Medical Sciences* for February and for August, 1837, it was reprinted in the *Dublin Journal of Medical Science*, September, 1837, and abstracted in the *London Medico-Chirurgical Review*, October, 1837. The next year it was translated in *l'Experience* of Paris and Valleix gave full confirmation to Stillé's report of Gerhard's conclusions in the French literature of 1839. February, 1840, G. C. Shattuck of Boston reported 13 cases in the *Philadelphia Medical Examiner*. A. F. Stewart presented his first report on the subject in April, 1840 before the Parisian Medical Society and this account was published in October, 1840. The December, 1861 number of the *London Medical Times and Gazette*, just subsequent to Prince Albert's death from typhoid fever, contained a rather patronizing note from Stewart inferring priority in the definition of the two conditions. Stillé vigorously assailed this position as demonstrating an "apparent want of candor" on Stewart's part. His bitter imputation of Stewart's motives would have been more effective, had he not indicted the British profession on the charge of "woeful blindness" and "inertia." Gerhard took no part in the controversy. The recognition of his priority by Graves and Louis must have compensated for this futile effort at detraction.

Clinical Medicine

Dr. Gerhard continues his course of instruction in Practical Medicine.

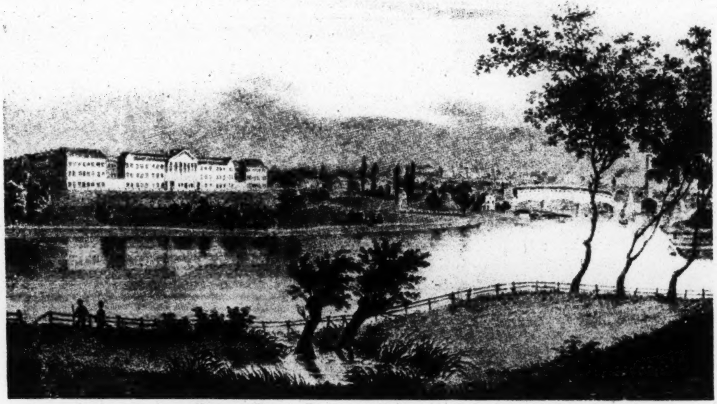


Fig. 4. Philadelphia Almshouse, 1840.

Apparently in response to the common demand of clinical students for a guide to the newer methods of physical diagnosis, Gerhard in 1837 wrote an elementary treatise on the subject, "Clinical Guide and Syllabus of a Course of Lectures on Clinical Medicine and Pathology." The continental influence was conspicuous in many details. For example he neglected inspection and palpation in favor of percussion and auscultation. So sketchy is the text that the concluding note is welcomed with considerable relief: "As the object of the syllabus is rather to serve as a guide to the observations of the student than to supply the place of a systematic work, the omission is less to be regretted."

The following notice, which appears in the back of the book, probably explained this literary excursion in some measure.

It consists of a series of Lectures on Pathological Anatomy, Diagnosis, and Therapeutics, illustrated by Clinical cases in hospital practice. To render the course still more complete, a private dispensary will shortly be connected with it.

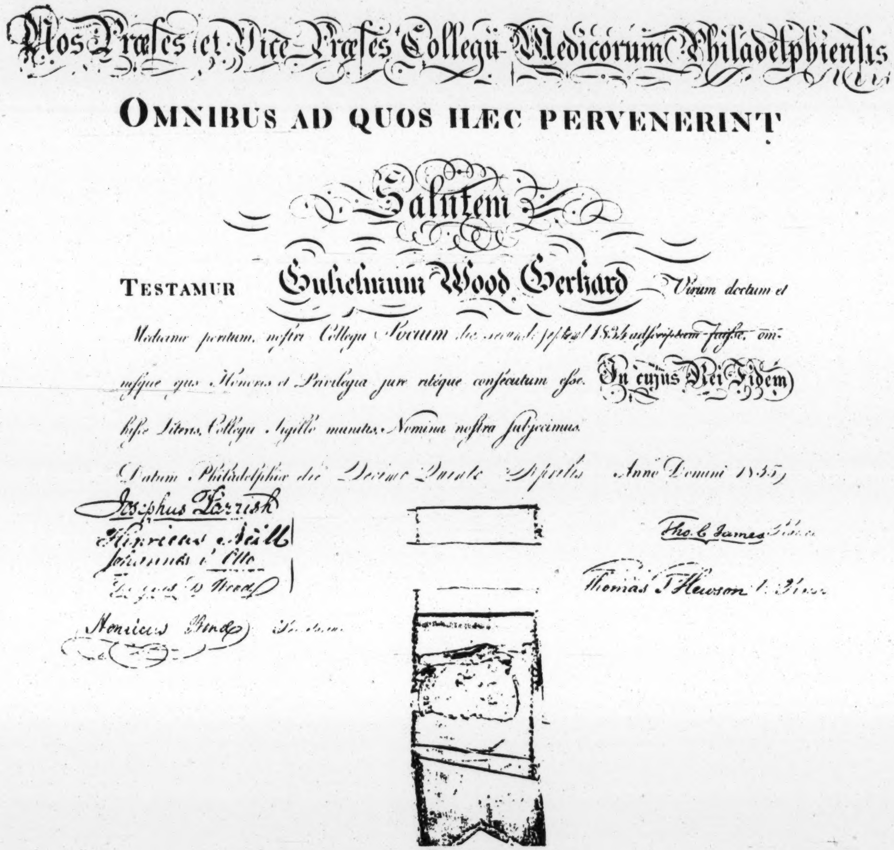
Special attention is paid to render the student familiar with the improved methods of Exploration of the Chest by Auscultation and Percussion, and as far as possible to prepare him for the active duties of his profession.

The winter course commences in the first week in November. The summer course in the first week of April.

A limited number of private pupils received on the usual terms.

Philadelphia, No. 281 Chestnut Street.

In 1842 Gerhard published his "Lectures on the Diagnosis, Pathology and Treatment of the Diseases of the Chest." The work is worthy of its author in every detail. The first American textbook to elucidate the improved methods in this field, it enjoyed an unusual measure of popularity and passed through four editions—the last in 1860. With few additions the text represented essentially his clinical lectures. He remarked prefatorily that "the form adopted in printing this volume may deceive the reader as to the amount of matter contained in it, which is about equal to that of an ordinary volume of four hundred pages." Source references were purposely avoided in the effort to simplify the text. Due credit was accorded the French school for its outstanding contributions to this field of medicine. Grateful acknowledgement was made of Pennock's contribution of an excellent plate which illustrates the text. Lacking the Roentgen ray to check the results of percussion this clinician had utilized steel pins to mark off the cardiac borders in the cadaver. Gerhard also credited Pennock with the introduction of the flexible tube in connection with the stethoscope to eliminate the shock of the cardiac impact.



Nos Præses et Vice-Præses Collegii Medicorum Philadelphiensis

OMNIBUS AD QUOS HÆC PERVENERINT

Salutem

TESTAMUR Gulielmum Wood Gerhard Virum doctum et Medicinæ peritum, nostri Collegii Socium die [illegible] 1834 adscriptum fuisse, omnisque ejus Honores et Privilegia jure ritèque consecutum esse. In cujus Rei Fidem his Literis, Collegii Sigillo munitis, Nomina nostra subjecimus.

Datum Philadelphiæ die Decimo Quinto Aprilis Anno Domini 1835.

Josephus Parrish
Henricus Neill
Johannes C. Otto
Georgius B. Wood
Henricus Bond

Tho. C. James
Thomas T. Hewson

FIG. 5.

Although Gerhard was confident of the usefulness of the more recent methods of physical diagnosis he insisted upon the support of the history. He pointed out that negative as well as positive findings must be evaluated. "The abuse of a certain method of observation does not constitute a real objection to its employment; it merely proves that it is necessary to surmount the first difficulties which attend its acquisition," he averred. His teaching was essentially practical as the following quotations indicate:

> The physical signs, properly speaking, may be classed under the heads of alterations in the conformation of the thorax, resonance of the chest on percussion, and the sounds yielded by respiration, or produced during the act of coughing or speaking. . . .
>
> The hand forms, as it were, a kind of natural calipers, and will give very accurate results. . . .
>
> Percussion indicates merely the relative density of the lung. . . .
>
> There is also a little dullness of sound at the summit of the lungs; on the right side, in most individuals, it is a little less clear than upon the left.

Gerhard claimed priority for the anatomic explanation of the normal difference in the respiratory sounds at the two apices. His attention was directed to this detail by James Jackson, Junior's, failure to make allowance for the physiologic differences. Gerhard attributed the change in breath sounds to the larger caliber and shorter length of the bronchus to the right apex.

Many of the clinical points in this text deserve close scrutiny and preservation. For example Gerhard appreciated the significance of so-called primary pleurisy. Speaking of latent pleurisy, he wrote, "In the cases in which the disease passes into the tuberculous form, it generally terminates favorably; if it be long neglected, however, the disease is sooner or later transformed into pulmonary phthisis." In another connection he stated that "the occurrence of tuberculous, or even the long continuance or frequent repetition of simple pleurisy, is another indication of phthisis." With reference to whooping cough, he noted, "Phthisis occurs as a sequela of this disease, and does not require medication; it is best treated by a change of air, which is advantageous in the declining stages of all severe cases of pertussis." In his opinion hemoptysis in excess of a wine glassful was significant in the conclusion of phthisis.

The indecision of the day relative to the pathology of tuberculosis is reflected in this quotation:

> It is very clear, however, that tubercles do not constitute the disease. . . . The disease is essentially a morbid condition which either precedes for a long time the formation of tubercle, or it is more acute in its character, and is then accompanied or quickly followed by this product; the local diseases which often precede tuberculosis being . . . merely an exciting cause.

He pointed out that "the tuberculous diathesis, that is, the general disorder, may be developed to a very intense degree, and yet the local mischief may be slight, and tubercles may be scattered over a large number of organs." As noted previously Gerhard remarked the increased frequency of bronchial lymph-node involvement in children. His wide pathologic experience led him to the firm belief in the healing of the process.

> Phthisis is therefore strictly a curable disease, notwithstanding that in a majority of cases it terminates fatally, at an earlier or later period. This arises not so much from the effects of the first crop of tubercles as from the successive

deposits of new ones in different parts of the lung, or rather from the accompanying fever and irritation. Hence a patient rarely dies of one attack of phthisis, except it be of a very acute form.

Essentially a polytherapist Gerhard's treatment was usually well tinctured with common sense. Interestingly he commented thus, "The therapeutics of phthisis have advanced to some extent, but in a less degree than the natural history of the disease." The advantages of change in climate for tuberculous patients were in his judgment much overrated. Particular stress was laid upon hygiene in his regimen. While bleeding was not advocated by him in tuberculosis, his discussion of this measure in pneumonia is noteworthy:

> Thus, in the commencement, a very large bleeding, pushed to the verge of syncope, is certainly best in a plethoric individual, or a moderately strong person, previously in good health, if the pneumonia is of a highly inflammatory kind—that is, if the evidence of vascular excitement be decided; for it is in these cases that the inflammation tends necessarily to diffuse itself, as it were, over a large surface, and to attack several organs, especially the serous tissues of the circulating system. A large bleeding is of course the surest method of checking this tendency, and is the most comforting remedy for the patient, as it at once diminishes the headache and the oppression which are amongst the most disagreeable symptoms.

In general the discussion of cardiac affections suffers by contrast with the author's grasp of pulmonary diseases. However, he was fully aware of the frequent responsibility of rheumatic fever for heart disease. His clinical instinct led him to the shrewd observation that "palpitation of the heart is more constant and troublesome to the patient in simple nervous disorders than in organic disease; in the latter case it is usually provoked only by violent exercise, or by some sudden effort." He strangely concluded that functional disease may lead to organic affections and that cardiac hypertrophy may give rise to valvular disease and inflammation of the endocardium. Relative to aortic lesions Gerhard's note that deep-seated oppression might arise from this source is worthy of preservation.

The *American Journal of the Medical Sciences* served as a clearing house for Gerhard's clinical reports until 1838, when his name appeared as one of the editors of the *Medical Examiner*. Herein not only appeared Gerhard's personal reports from this time but also the case reports of his successive resident physicians at Blockley. His name was not included as an editor in Volume 6, 1843 and the omission passed unnoted, except that the issue of January 21, 1843 remarked the return of Meredith Clymer after four years' absence to assume complete editorial charge. No explanation of this action was forthcoming; but it is a significant fact that after years of activity in the medical literature, Gerhard ceased to contribute in 1842 and never again resumed this phase of his work.

Other interests were doubtless engaging much of his time and energies. In the first number of the *Medical Examiner*, January 3, 1838, the following notice appeared:

> Philadelphia Hospital.
>
> This institution is attached to the Philadelphia Almshouse, situated in the district of Blockley, on the western bank of the Schuylkill, Clinical Lectures are here delivered, during the winter season,

on Saturdays, from 10 o'clock, A.M. to half-past twelve, P.M., by the surgeons and physicians of the hospital, on duty at that time. Dr. Gibson lectures on Surgery during the first three months of the winter, and Dr. Harlan, during the remainder of the term. The medical lectures are given by Drs. Jackson and Gerhard.

This association of Gerhard with his old teacher must have proved most stimulating and heartening. Samuel Jackson was in the zenith of his remarkable career and doubtless still conveyed to his former student that contagious enthusiasm which had led him to seek the fountain-head of the newer practice in Paris. Gerhard rapidly rose to a commanding position in the capacity of a clinical lecturer. Stewardson wrote:

> Without any pretension to eloquence, he nevertheless riveted the attention of his hearers and stimulated their enthusiasm. Himself deeply interested in his subject, he communicated this interest to his audience by the sheer force of truth. Students saw that truth was his object, not display; the advancement of science, and not the gratification of personal feelings, whether of vanity or ambition; in short, that in his mind, a deep interest in his subject and a thorough conscientiousness in the pursuit of it were the overmastering motives. In an easy and conversational style he presented to his hearers a graphic portraiture of the case before them, bringing into relief its most important symptoms; impressing upon their minds the most striking features in its history; pointing out, by a few clear and practical expressions, the bearing of any particular fact upon interesting medical questions, but avoiding long and laboured arguments, or general disquisitions upon the nature of diseased action. He neither stimulated the fancy by the flowers of rhetoric, nor amused the intellect with episodes upon theoretical questions, but confined himself to drawing such practical conclusions as were clearly deducible from the facts presented.

The wonder grows that Gerhard never held nor yet aspired to higher academic position. Stewardson insists that he had no such ambitions. In fact he himself doubted his capacity as a general lecturer. Perhaps his old preceptor Parrish's words remained fresh in his memory, "My bark was made for quiet waters."

"Hospital Gleanings, Doct Gerhard's Term, July 1st, 1847," is the designation of a note-book in the Library of the College of Physicians of Philadelphia. The case records, apparently from the hand of a house officer of the day, are succinct and clear. Progress notes were carefully kept with especial reference to the general condition of the patient, the state of the skin and the tongue, the nature of the pulse and the abdominal sensibility. Under the date of September 3, 1847 there appears a note to the effect that "Valentine Stoltzer leaped from 2nd story window last night while delirious and died soon after." Details of therapy were also carefully noted. Necropsy findings appear in appropriate relations with conclusions and suggestions of Doctor Gerhard bearing upon the particular case.

In his later years when partially incapacitated by his infirmities, Gerhard did not make routine rounds but would have the interesting patients arranged close to the entrance of the ward. Dr. Robert Alison, a resident physician at the Pennsylvania Hospital during Gerhard's service, related the following episode: "An undiagnosed case had been placed in the most remote bed in the expectation that it would escape Gerhard's scrutiny. Instead the chief came to the top of the steps leading down to Ward 3 and said, 'Gentlemen, I see you have a case of yellow fever.'"

His diagnostic acumen was remarkable and his services were widely sought not only as a family physician but also as a consultant. He seemed to have an intuitive knowledge of disease which coupled with his delicate sense of hearing peculiarly fitted him for the study of the diseases of the chest. A story related by his grandnephew, Doctor Arthur Howell Gerhard, well illustrates the power he held over his patients:

> Dr. John Hill Brinton, Professor of Clinical Surgery at Jefferson and an earlier resident physician of Gerhard's, was walking down Spruce Street to attend to his duties at the Pennsylvania Hospital. Dr. Gerhard saw him from the opposite side of the street and called, "Brinton, come here." The latter crossed the street and Gerhard said, "Brinton, go to bed. You are ill." Brinton in relating the experience continued, "I never felt better in my life; but such was my confidence in Gerhard that after my duties were over, I went to bed and there I stayed for three months."

Nor were Gerhard's activities limited to the practice and the teaching of medicine. In 1838 he became a prime mover in the foundation of the Pathological Society of Philadelphia. With the support of Pennock, Stewardson, Norris, Stillé, Pepper, Mütter, Goddard and other rising lights, of that period, the organization was a success from the outset. Gerhard was its first president and fittingly in recent years a medal has been struck by the Society in his name and awarded for meritorious studies in this field. Then, too, with William P. Johnston he organized and conducted the dispensary clinics in the Medical Institute in Locust Street. For two years (until 1843) they were so housed and then they were transferred to the University buildings under the respective professors but with Johnston and Gerhard still in immediate control. When the latter resigned, a silver pitcher engraven with the Philadelphia Dispensary was tendered him by his colleagues. This token of appreciation is now in the College of Physicians of Philadelphia.

James Tyson, a later pupil, pictured Gerhard as tall with a "not unbecoming stoop." As shown in existing likenesses his features were rugged and irregular. Thick convex lenses accentuated the natural prominence of his eyes. His homely countenance was usually lighted with a smile. Doctor Tyson related that his facetiousness was perpetual:

> Even one who knew him could never be quite certain whether the Doctor was in earnest or not, he was so constantly joking. So, at least, it was while I knew him. His habit of addressing the students who sat on the front benches in the amphitheatre as victims of malaria was alarming and disconcerting to the tyro, but the older men soon learned to understand the joke and to enjoy it.

Stewardson noted that he was most considerate of his fellowmen, charitable toward others and incapable of harsh animosity in any extremity. He continued his estimate of Gerhard thus, "Placid in temper, kind and generous in his feelings, genial and gentle in his manners, he won the affection as well as the respect of his associates, and has left a void which will be long felt in the circle of his intimate friends." In the light of so unanimous an opinion S. Weir Mitchell's characterization of Gerhard stands in bold and inexplicable contrast, "A man quick of speech and as quick to regret, an unbalanced nature, but a keen and subtle observer." Neither contemporary estimates nor family records of the man justify this rather acid vignette.

In 1837 Gerhard contracted typhoid fever by contact, it was thought, on the wards at Blockley. He apparently recovered completely from this illness; but six years later experienced an obscure malady with slight loss of power in one leg from which he never completely recuperated. He believed that he had suffered from a slight stroke of apoplexy. An European sojourn in the summer of 1844 was most beneficial both physically and professionally. On his return to Philadelphia he threw himself into his teaching and practice with renewed vigor. His position established and his future assured, he married the daughter of Major William A. Dobbyn, a retired British Army officer, in 1850. Three children were born to this union, all of whom with the wife survived Gerhard. In 1845 after ten years of service he resigned from the staff of the Philadelphia Hospital. His election to a similar position in the Pennsylvania Hospital on June 30, 1845 together with the increasing demands of practice and teaching probably actuated this move. The latter hospital appointment was held until May 2, 1868, although James Tyson, a resident physician in 1863, remarked, "When I came to reside at the latter Hospital . . . his brilliant teaching days were over and he is better remembered by resident physicians of that day for his sallies of wit and humor, than for serious clinical teaching." However, in 1867–68 Gerhard compiled the first volume of Pennsylvania Hospital Reports, which are valuable in a large measure by reason of his discussion of the fevers. The summer of 1868 was spent in Europe and Gerhard derived great satisfaction from a visit to his beloved teacher, Louis. The fracture of his ankle in December, 1868 proved a very serious shock and his ultimate decline dated from this injury. Thereafter he resumed only a small portion of his exacting practice and finally after months of premonitory symptoms died of apoplexy, April 28, 1872, at sixty-two years of age. He was buried in South Laurel Hill.

Contemporary judgment of a departed confrere is frequently biased by emotion and attachment. In the perspective of intervening years William Wood Gerhard looms as a magnificent figure in the medical world but scarcely as the greatest clinician this country had produced up to that period. Many of his contributions to the literature have been lasting and certain of them epochal; but his assured place in medical history rests upon somewhat different grounds. Of all the American students in Paris in that golden era of medicine Gerhard was the most conspicuous. So thoroughly had the spirit of Louis permeated his mental fiber that it fell his lot to bear the torch of clinical progress from France to America. With the passing of the school of theorists in the persons of Benjamin Rush and his followers, America in general and Philadelphia in particular stood ready for rational guidance in medical thought and progress. Unquestionably the writings and teachings of William Wood Gerhard did more to mold medical practice in this country than any other factor of that critical period.

MEDICINE IN CHARLESTOWN 1750-1775*

By JOSEPH IOOR WARING, M.D.

CHARLESTON, S. C.

IN his history, Garrison has characterized the medicine of the eighteenth century as "dull and sobersided," but admits that "this periwigged period is conceded to have been the 'Golden Age,' alike of the successful practitioner and the successful quack."[1] The social status of the physician was, if anything, better than it is today. Systems flourished and heroic treatments abounded. This was the time when Boerhaave was eminent, when Von Haller was developing physiology, Stephen Hales was inserting enormous manometers into blood vessels, the Hunters were leaders, and Priestley was discovering oxygen. Auenbrugger was progressing from barrels to chests with his tapping, and Morgagni was delving into the cryptic places of pathology. Leyden, Paris and Edinburgh were the leading centers of medical education, and drew students from all over the old and new worlds.

The period from 1750 to 1775 was one of prosperity and progress in Carolina. Earlier pioneer difficulties had been largely overcome, and the colony flourished in the favor of the Georges, first and second. Under Governor Glen's administration, Charlestown made many strides. Over 220 vessels sailed each year with produce carried chiefly to England and the West Indies, which absorbed eagerly the rice, indigo, and pelts coming in abundance from the province. In 1750 the population of the state was about 25,000 whites and 39,000 negroes. By 1773 there were 65,000 whites. In 1770 Charlestown was a city of 1770 houses, and contained over 5000 white people and nearly 6000 blacks. A few years later Josiah Quincy, visiting from Massachusetts, wrote:

> This town makes a most beautiful appearance as you come up to it, and in many respects a magnificent one. I can only say in general that in grandeur, splendour of buildings, decorations, equipages, numbers of commerce, shipping, and indeed in almost everything it far surpasses all I ever saw or ever expected to see in America. . . . The number of shipping far surpasses all I have seen in Boston. I was told that there were not so many as common at this season, though about three hundred and fifty sail off the town, which struck me very greatly; and the new exchange, which fronted the place of my landing, made a very handsome appearance.

Good schools were in session, and a great many of the inhabitants could boast of a European education. The theater was active, horseracing was popular, and Charlestown's wealth and culture were conspicuous in the new country.

In these flush times life was not uneventful for the colonists. In 1752 a great hurricane flooded the city, and in its damaging activity, carried the Sullivant's Island pesthouse several miles up the Cooper river, drowning nine people. A few years later difficulties arose with the Indians, and continued to engage the settlers until 1759, when Gov. Lyttleton made his treaty with the Cherokees, a treaty which was to be broken very soon by a new Cherokee war. Yellow fever was present in relatively mild and infrequent form in 1753 and in 1755, then disappeared temporarily during this period. Smallpox achieved prominence in 1760, and to a lesser extent, in 1763, then practically faded out until 1780, some time after the people of Charlestown had held their meetings under the Liberty tree, had poured their own tea into the harbor, and had plunged into the Revolution.

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* Read before the Medical History Club, Charleston, S. C.

Dr. William H. Welch speaks with admiration of the physicians of this time:

> There was no more cultivated and attractive group of medical men in the third quarter of the eighteenth century in America than that in Charleston, S. C. . . . Of these Bull was a pupil of Boerhaave, and Chalmers, Moultrie, Lining, and Garden were trained in Edinburgh. These men were abreast of the knowledge of the day: some were naturalists as well as physicians, their names being perpetuated in those of plants, fellows of the Royal Society, and correspondents of Linnaeus, Fothergill, and other European savants.[2]

This brief sketch does not permit a discussion of these tall figures in our early medical history, whose lives and works have already been ably described. They were all active at this period. Bull was prominent in the political affairs of the colony, but as far as we know, was never active in medicine. Chalmers was busy during the whole of this time writing his essays on fevers, his reports on tetanus, and his observations on the weather of the province. John Moultrie lived until 1771. His son, John Moultrie (to whom Garrison[1] wrongly gives the honor of being the first American to graduate abroad) returned to Charlestown shortly after his graduation in 1749, practiced, married twice, and in 1767 departed for Florida, where he became Royal Lieutenant Governor, and remained loyal to the crown. Incidentally, the real "first graduate," William Bull, likewise remained a royalist in South Carolina. Lining, whose history of yellow fever and experiments with electricity and observations on meteorology and physiology brought him fame, lived until 1760. Garden came out from Scotland about 1750 and was engaged in making his many valuable observations on botany and natural history until after the time of the Revolution. Ramsay did not come to Charlestown until 1773.

The *South Carolina Gazette*[3] is the chief source of some rather sketchy glimpses of medical affairs of this time. The first item gleaned from its columns is a very flattering obituary notice of Doctor, and Judge, Thomas Dale, a man of prominence in his profession and in the affairs of the town, whose life story has been recently written.[4] Soon afterward appears an advertisement of a Doctor Thomas Chalmers, who "offers a charitable cure to any poor people. . . . who are unable to answer a physician's charge," and gives the advice that a good method of prevention of the diseases here is to boil the drinking water with a little snake-root in it. Apparently the wave of quackery which was flowing prosperously over Europe included the colonial possessions. Advertisements of importations of drugs mention many of the popular secret medicines of the day: Radcliff's elixir, Daffey's elixir, James' powders, Lockyer's pills, Speedman's pills, Pectoral Balsam, all associated with prominent practitioners of varying standing of London and elsewhere. The South Carolina Almanack for 1759, adhering more closely to local remedies, gave account of Dr. Tennant's (of Virginia) cure for pleurisy, Sampson's cure for rattlesnake bite, Mr. Howard's cure for yaws, etc., and the negro Caesar's method of expelling poison. The last was apparently very popular, for it was reprinted in the *Gazette* several times, and its inventor was freed and pensioned by the legislature. Howard's cure appeared in detail in 1759, and consisted of bleeding and purging, and drinking large quantities of sarsaparilla, china root, guiac, etc. Howard, the author, thanked the House of Assembly publicly for the provision made for his discovery. Next week appeared a notice from the Commons directing that the cure be published for the benefit of the public. The virtues of the treatment did not go unchallenged, for shortly thereafter came a letter in very broken English, stating that Howard's cure was absurd, and advising that people with any sign of cancer go to the writer, one Dr. August Gottfreed Jehne, for treatment.

The printer of the *Gazette* must have been something of an amateur apothecary, for he sold Pierce's Styptic, and published many articles on diseases and cures. He likewise sold several editions of "Every Man His Own Doctor," a family medical book, and did not scruple to put in an occasional testimonial as to the value of various medicines. Advertisements of Dr. Keyser's antivenereal pills with money-back guarantee appeared several times. Maredant's anti-scorbutic drops, "The most effectual Medicine that has ever yet been offered to the Public" were to be had at the printers, along with the warning that one bottle might aggravate, but that six or seven bottles would surely cure whatever ailed the purchaser. Yet in 1773 appeared a rather sarcastic news item, as follows:

> Lately arrived in town, a Gentleman who, though he was not born or bred in Scotland, nor has received any University Education, proposes to lay waste the whole Materia Medica, and raise a New System upon its Ruins. There are no disorders incident to Human Nature (except the Gravel, Stone, and Dropsy) for which he had not an infallible Remedy—the Materials taken from the Neighborhood of Georgetown. No Bleeding, Blistering, Purging, or Vomiting.

This perhaps was the William Vernon Turner who was attacked violently in a long letter appearing later on and signed by a noncommittal "Jeremiah," who doubted vigorously Turner's claim as to association with the Hunters and others, and his intimate knowledge of the herbs of America. An advertisement of about 1770 is of interest in that T. Lowden, late midwife and apothecary to St. Peter's Hospital, Bristol, announced his intention to practice, and likewise to establish a sort of dispensary, in that he would give free service to the poor every afternoon from 12 to 3, in Church St., opposite John Izard. Earlier than this, in 1765, Andrew Judah, physician, had announced his intention of practicing at the corner of King and Queen Sts., and of setting aside daily hours for the free treatment of the poor. Perhaps these irregulars were responsible for the defeat (1765) of a bill which would have required that persons desiring to practice Physick or Surgery must first be examined and licensed.

Public health measures were not in effect at that time except in regard to epidemics, but occasional references are made to improving conditions in the city. In 1750 an act for keeping the streets of Charlestown clean had been passed, but eight years later a letter cites the need of drains and a scavenger, and attributes sickness in the town to filth and odors. The Grand Jury several times deplored the state of the streets, the feeding of cattle in the same, the lack of lamps, wells, and pumps, the increase of Dram Shops, and indicted Thomas Lamboll for keeping a stagnant pond on White Point, whence numberless insects arose. One can almost catch from the old newspaper the aroma of the town, which still had its whipping corners and its pillory, its drawgate and moat, its regulation against riding horseback or driving faster than a trot in the streets, and its burnings at the stake.

Smallpox and rumors of smallpox figured largely in the life of the period. A report of an outbreak was denied in the press in 1754. Four years later announcement was made that smallpox had left the province, and had been only in Mr. deSaussure's family of twenty-four persons, all of whom had the disease and recovered. Next year it was reported among the Catawba Indians, of whom half the Nation was carried off, and of whose braves it was said that they threw themselves into the river as soon as they found themselves ill, in a vain attempt to check the contagion. Then it was heard of among the Chickesaws, and finally four cases were quarantined on Sullivant's Island. Early in 1760 it appeared in the town, on account of the premature release of a patient from the pest house, but the spread was slow, and the Governor intimated to the Faculty of Physic that inoculation was not to be done unless the disease spread from White Point. The *Gazette* carried a number of letters on the subject of inoculation and on smallpox, notably a reprint of one by Kilpatrick, who had achieved fame as an inoculator in earlier times in Carolina and in England. In February it was remarked that 2000 persons had been inoculated, and that one gentleman had upwards of 600 patients. By April 6000 had had the disease by inoculation or naturally, and over 700 persons had died. The Governor called for a day of fasting and prayer on account of the epidemic and the war with the Cherokees. By December the outbreak was over, but inoculation continued to be so popular, that in 1763 there appeared a letter complaining that the physicians were perpetuating the disease by their activities in that line. To this the physicians responded by an agreement to discontinue inoculation for six months, provided no one inoculated in any way. The names signed to this agreement are no doubt the list of reputable practitioners of the time, viz., John Cleiland, Robert Wilson, William Loocock, John Swint, Wm. Pillane, John Haly, John Moultrie, Lionel Chalmers, Alexander Garden, David Oliphant, John Murray, George Milligan, Samuel Carne. This agreement occasioned some public comment as to the condescension of the physicians, but in July it is noted that inoculation "is entirely dropt," and that refugees were returning to town. Just previous to this step, a crop of small hospitals for the accommodation of those desiring inoculation had sprung up. Elizabeth Giradeau, Drs. Carne and Wilson, Dr. Swint in King St., Dr. William Loocock in Broad Street opposite Union Street and others managed these hospitals, and most of them offered insurance against the dangers of the inoculation. These were possibly active again in 1763, when smallpox reappeared among the negroes, and inoculation became popular once more. An exodus of about 1500 persons from the infected city left only about the same number who had not had the disease, and these were favored with a mild epidemic. In 1771 a brig from the West Indies brought passengers with smallpox, who were promptly shut up in the pest house and infected no one. Again the next year a ship from Belfast brought smallpox, but the people on board were quarantined on Sullivant's Island and there was no spread of the disease. Apparently the pest house was not a very desirable residence, for it drew some criticism from the editor, who remarked that "if the Pest House on Sullivant's Island was made tight, warm, comfortable . . . and if some proper Person was appointed constantly to reside on the Island . . . who would say, we wanted common Humanity?" Except for the mention of a single case in 1773, smallpox disappears from the press until after the Revolution.

Two other epidemic diseases appeared in this period. In 1772 measles is spoken of as "very mortal" in the town. It seems that a child developed the disease on board a vessel bound from New York to Charleston, but recovered completely before reaching port. The master and the mate of the vessel, answering more or less truthfully the questions asked at Fort Johnson that there had been no contagion aboard when the vessel sailed and none when she landed, managed to slip the incubating cases through the ineffectual red tape and spread the disease over the city. These men came in for much public criticism, and replied rather lamely through the press, but escaped prosecution.

Earlier than this, in 1759, the editor had spoken of "that violent and present reigning Disorder, called the Whooping Cough," and a number of articles concerning its treatment were published, though no indication of the actual extent of the epidemic is given in the papers. Not infrequently other articles on medical subjects appeared in the *Gazette*. A lengthy abstract of Cadogan's essay on Gout suggests that the colonists had indulged too much of late in rich living, for an early writer had boasted that the disease was unknown in the younger days of the colony. Several articles on child care appeared, and contained much advice that fits in with our current ideas. A paragraph cautions parents and nurses with regard to the manner of holding their infants, and describes the changes in an infant produced by improper holding; one suspects from the description that these changes were rachitic. These articles evidently reflected the growing English interest in children, which interest had been demonstrated by the development of the Foundling Hospital and of George Armstrong's Dispensary. Advertisements of and for wet nurses, both white and black, are frequent and "spoon feeding" was no doubt in disrepute. A quotation, a "Receipt for Asthma" gives some reasonable advice, e.g:

If ven'son pasty's set before ye
Each bite you eat memento mori.

and:

Be not in haste, nor think to do
Your business with a purge or two:
Some if they are not well at once,
Proclaim their doctor for a dunce:
Restless from quack to quack they range,
When 'tis themselves they ought to change.

Except in a few instances, the *Gazette* tells little of the activities of the medical men of the period. That they figured extensively in the various affairs of the town there is no doubt. We find Dr. John Moultrie named president of Saint Andrew's Club, Dr. Alexander Garden president of the St. Cecilia Society (1767), and Dr. David Oliphant vice-president at the same time, Dr. Peter Fayssoux (who lived in Meeting Street, the third house below the "White Meeting") a manager of the same Society, Dr. Alexander Baron a member of the Library Society (and later, Curator of the Charleston Museum); Dr. Robert Wilson dissolves partnership with Dr. Carne, and carries on business on the Bay. He likewise takes a trip to Rhode Island. Dr. David Oliphant is a member of the Council of Safety. Dr. Loocock, surgeon, and Dr. George Milligan serve in the Cherokee War. The latter also sold drugs, as did a number of other physicians, for example Dr. Carne and Dr. John Lining. They no doubt also instructed apprentices, for beginning about 1760 it was the custom for the candidate for a medical degree to go through a preliminary apprenticeship before departing for Edinburgh or elsewhere for his regular course. In this connection, one finds in 1771 a list of "natives of the Province who have been graduated and had the highest degree in Medicine conferred upon them," viz., Drs. Peter Fayssoux, Charles Drayton, Isaac Chanler, Thomas Caw, and Tucker Harris, of whom the last two were still abroad. A later note adds the names of Dr. William Roberts, and Capt. Angus as graduates, and those of Mr. Robert Peronneau, Mr. Baker, and Mr. Logan as students at Edinburgh.

Many other names of physicians appear. One particularly seems to deserve notice, that of Dr. Lewis Mottet, whom we find in 1762 advertising that he will prepare "Belloste's" pills for fevers if he can get a number of subscribers, then offering for sale a "compleat and neat pharmacy" and books and instruments, then in 1764 entering a racehorse at the New Market Course, and finally in 1769 proposing unsuccessfully to the Commons House of Assembly that it establish an experimental pharmacy, botanical garden, and laboratory for the analysis of vegetables, animals, and minerals, and that he be made director of the same, and utilize his own apparatus, provided a loan of six thousand pounds be made to him. Johnson's "Traditions"[5] include several anecdotes of this gentleman, a bon-vivant who resided at first near Monck's Corner. In one instance in which a young man sick with intermitting fever had neglected the prescribed treatment, Mottet proceeded to give the patient a vigorous whipping, producing a rage and a perspiration which apparently cured the patient of his fever but not of his vexation. A lawsuit followed, and Mottet conducted his own defense, saying that he had only applied a stimulant and a rubefacient, and in his broken English was indignant that he should be charged with "sault and batter," which were for the cook, and not for the physician to use. He got off with one shilling damages. Mottet was jealous of Garden, and when he heard of Linnaeus' compliment in naming the gardenia, remarked that he too had discovered a very beautiful native plant, and had named it "Lucia," after his cook "Lucy."

The account of Dr. Haley's duel appears in full in the *Gazette*. Johnson gives the story as follows:

> In 1771, on the 16th of August, an altercation arose, at a genteel house of entertainment in St. Michael's alley, between Dr. John Haley and Delancy, an elegant, accomplished royalist, of New-York, a brother of Mrs. Ralph Izard. Delancy being irritated, probably from being foiled in argument, insulted Dr. Haley, by giving him the "lie." Haley immediately challenged Delancy to fight with pistols at that house, and proposed that they should go together to an upper room, alone, and without seconds. Delancy accepted the challenge, and the proposed arrangement. He took one of the pistols offered to him by Haley; they fought across a table, fired at the same moment, and Delancy was killed.
>
> Dr. Haley was an Irishman by birth, an eminent practitioner of medicine in Charleston. He warmly espoused the popular cause in opposition to royalty, and, as a man of education and influence, was much encouraged by the leaders of the incipient revolution. Delancy being a very distinguished man among the royalists, much irritation was exhibited among them, at his death, and the circumstances attending it. The whigs, on the other hand, defended Dr. Haley, and concealed him until his trial came on. During this concealment, being secluded from society, and deprived of his usual occupations of mind and body, he became melancholy, and this depression was increased by an accidental occurrence that took place while he was in this seclusion. In passing, after dark, across the enclosure where he stayed in the country, a clothesline caught him by the throat, and stopped his course. He considered this to be ominous of his fate, and the impression could not be dispelled by the reasoning or the jokes of his friends. . . . His cause, however, had been taken up as a party dispute. Thomas Heyward, the Pinckneys and the Rutledges defended him in his trial. They proved that Delancy was the aggressor; that he not only accepted the challenge, but the terms also; that he took Haley's offered pistol, and voluntarily followed him up stairs into a private room, as had been proposed; that he fired with intent to kill Haley with his own pistol, for the two balls with which it was loaded were taken out of the wall just back of his adversary, one on each side of where he stood. Haley was acquitted, and his acquittal was considered a great triumph by the whigs and popular party, situated as they were under the royal government. It was also considered by the royalists a proportionate source of chagrin.

One other earlier incident of this period (1755) may be recalled: the meeting of the Faculty of Physic at Mr. Gordon's Tavern for the purpose of protesting against inadequate fees, and the unnecessary hardships imposed by their patients, a meeting which only served to stir up a series of letters and verses upholding or condemning the medical men.[6]

The Revolution brought many changes to the medical profession of Charlestown. New names became prominent, and new activities furnish historical material for an account outside the scope of this paper.

REFERENCES

1. GARRISON, F. H. An Introduction to the History of Medicine. Ed. 4, Phila., Saunders, 1929.

2. Welch, W. H. Influence of English medicine upon American medicine. In: Contrib. to Med. and Biol. Research. N. Y., Hoeber, 1919, 2: 811.
3. *The South Carolina Gazette*. Files of Charleston Library Society.
4. Seibels, R. E. Thomas Dale, M.D. Ann. Med. Hist., n.s. 3: 50, 1931.
5. Johnson, J. Traditions and Reminiscences . . . of the American Revolution. Charleston, Walker and James, 1851.
6. Waring, J. I. An incident in early South Carolina medicine. Ann. Med. Hist., n.s. 1: 608, 1929.

[From Erastus: Varia Opusculum Medica, Frankfurt-a-M., 1590.]

EVOLUTION OF THE CONCEPT OF FEVER IN THE NINETEENTH CENTURY

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THE nineteenth century opened with little to suggest the profound change about to evolve in the ideas concerning fever. With certain few exceptions, the general profession entertained a curious mixture of the realization, on the one hand, that fever is a result of disease, and on the other a tendency to regard it as a disease in itself. The cause for this conception could be traced back at least to Hippocrates. It is true that Erasistratus, who named the tricuspid valve and narrowly missed discovering the circulation of the blood, had asserted that without inflammation there was no fever. Hippocrates, however, apparently regarded fever as a separate entity, for in his "Epidemics" he said:

> Each of these fevers has its modes, its constitutions and its exacerbations. For example, a continuous fever in some cases from the beginning is high, and at its worst, leading up to the most severe stage, but about and at the crisis it moderates. In other cases it begins gently and in a suppressed manner, but rises and is exacerbated each day, bursting out violently near the crisis. In some cases it begins mildly, but increases and is exacerbated, reaching its height after a time; then it declines again until the crisis or near the crisis. These characteristics may show themselves in any fever and *in any disease.*[1]

Regardless of this, there was no insistence upon the essential nature of fever such as occurred with later writers on disease.

Galen did little to clarify the notion of fever, although he had some conception of its causation by infection, for in the section on inflammation from "The Therapeutic Method," he said: "It is easy to recognize inflammation of visible parts of the body; it is not as easy to recognize that of hidden parts, which necessarily gives rise to fever."[2]

Sydenham apparently speculated very little as to the real nature of fever but was content to accept it as a natural manifestation of disease. In reality this would have been a healthier notion than the later ones which became complicated by increased observation, that while many patients presented a definite cause for fever, such as infected wounds, abscesses, and gangrene, there were also many other patients with fever who presented no physical findings ascertainable by the methods of examination of that day. As Sarton, speaking of medieval medicine, said:

> The outstanding medical advances have been due to the gradual invasion of the medical art by outside sciences—chemistry, physics, bacteriology, etc. With some pardonable exaggeration one might say that medicine progressed by ceasing to be what it was and surrendering its territory to other disciplines absolutely different from its own. Without the marvelous instruments which modern physicists have given to mankind, such as high-power microscopes, polarimeters, spectroscopes, sensitive manometers and galvanometers, *x*-ray and radium tubes, etc., the physician

was essentially an artist, not a scientist; his main props were his experience, and his common sense, his clinical intuition. To be sure, these have kept their full value to this day, and no manner of instrument will ever make up for the lack of wisdom. However, during the Middle Ages the physician had no help whatever but what he could find or hoped to find in books; no scientific guidance of any kind, except unfortunately a wrong one [astrology].[3]

Not only was the physician, at the beginning of the century in question, obliged to rely mainly on his own senses for the recognition of fever, but until the time of Clausius, who was born in 1822, heat, and together with it, fever, was mistakenly regarded as a material substance. This belief harkened back to the air-fire-water-earth philosophy of Empedocles and even Descartes believed that the movement of the heart was due to internal heat or fire. The clinician of this period was without a usable clinical thermometer. Sanctorius, it is true, had described a clinical thermometer in 1625, and various thermometers, including the air-thermoscope of Galileo and the water-thermometer described by Rey, had been known; but even Traube, who introduced the thermometer into his clinic in 1850, and who originated the now familiar fever curve, an indispensable part of all hospital records, was forced to use a thermometer nearly a foot long which had to be placed in the axilla and left twenty to thirty minutes. Sir William Thompson as late as 1849 established a method of standardizing thermometers and the present type of clinical thermometer, so easily carried and used, was introduced by Allbutt in 1868.

Lacking the proper instruments, the efforts of observers were largely manifested by innumerable divisions and classifications of febrile diseases which could not be explained in the light of their lack of knowledge concerning pathological anatomy, physiology or bacteriology. Perhaps a better idea of the conceptions current during the early part of the nineteenth century or even into the third quarter may be obtained by considering the statements not only of physicians who were eminent at that time but also of some who might be considered to belong to the rank and file of the practitioners.

It was significant, perhaps, of the slow progress which was being made that Maximilian Stoll, whose "Aphorisms on the Diagnosis and Cure of Fever" was published in 1787, should have used a large number of statements taken from Boerhaave, who died in 1738. Furthermore, this work was translated into French by P. A. O. Mahon, Professor in the School of Medicine at Paris, in 1801. Since Boerhaave and Gerhard von Swieten had both used a crude Fahrenheit thermometer, it is reasonable to suppose that Stoll also made use of it. He believed, however, that fever was a disease in itself. In his eighth and ninth aphorisms he said:

> Therefore, the idea of fever should not be drawn in general from the fermentation and dissolution of humours, nor their coagulation, nor density; for fear of mistaking certain distant causes for fever itself or its effects for the proximate cause.
>
> It is necessary, therefore, to conclude that fever is a sickness not of this or that humour alone, but of the entire organism.[4]

Stoll recognized, however, that inflammation of various parts was accompanied by fever. He understood the significance of chills and noted that a recurrent chill either indicated a complication of an already existing infection or the formation of an abscess. He also stated that the more severe the chill in the beginning, the more dangerous the fever.

J. L. Alibert published his "Treatise on Intermittent Pernicious Fever" in 1809. This work was dedicated to Pinel but the author failed to take the hint which Pinel had already thrown out regarding the symptomatic nature of fever. His opening statement in the book was as follows:

> Without doubt few illnesses go further to prove the ability of medicine and the exactitude of its methods than the fevers which comprise the subject of this treatise. But nothing is usually more difficult to demonstrate than their true character in the multitude of their anomalies and the innumerable phases which they present. Moreover, the oldest masters of the art imperfectly understood their nature and totally ignored the suitable method of treatment.[5]

The exactitude promised in this opening paragraph, however, was not fulfilled in the remainder of the book for many of the cases quoted were undoubtedly not malaria. Oddly enough, Alibert anticipated and vitiated Müller's notion that fever is a nervous reflex by asking how it is that many patients may have fever and show no involvement of the nervous system, while others may have convulsions and present no fever.

For reasons which will be discussed later, it was evident, however, that enlightenment was beginning among the French. F. G. Boisseau wrote a "Treatise on Fever" in Paris in 1823. This work ran through at least four editions and the translation by J. R. Knox was published in Philadelphia in 1832. Boisseau gave considerable credit to Pinel as recognizing the symptomatic nature of fever and his endeavor to refer the appearance of fever to the part of the body which appeared to be particularly affected. He regretted that Pinel did not take the investigation of fever seriously but used it as a mere recreation of the mind. He also stated that if the word *fever* is still to be retained in the language of science, it should be regarded only as designating a symptom. Concerning the views which had existed since the time of Hippocrates and Galen, Boisseau had this to say:

> All this is to be attributed to the exclusive and superficial study of symptoms, to which too much importance has been assigned, to a vicious and forced generalization of ideas, to the rejection of sound physiological reasoning; to the want of an etiology founded upon a just comparison of the phenomena of health and those of disease, to preconceived ideas of the nature and seat of fevers; to negligence in making autopsic examinations, to the indifference and even fear manifested with regard to this mode of investigation, in the case of fevers, and, to sum up all in a few words, to the separation of physiology, pathology, and therapeutics, and especially to the imperfection of pathological anatomy.[6]

Finally, having credited Broussais with localizing the cause of fever but disagreeing with him in placing the chief emphasis in the gastrointestinal trace, Boisseau delivered a modern paragraph to the effect that:

> A new era is commencing in medicine. The edifice of science is not to be rebuilt, but additions are to be made to it, and many parts, which time has destroyed, are to be replaced. It is to be desired, that each physician, anxious to contribute to the perfecting of the science of disease, should make himself master of a portion of the ancient pathology, compare with it the observations of his predecessors and contemporaries, and the results of his practice, arrange the whole according to

> the lights furnished by the most recent progress of pathological anatomy, and physiology, and present the facts of which we are possessed, in a manner corresponding to the actual state of the medical science.[7]

Contrasted with this was the work of Henry Clutterbuck, Senior Physician to the General Dispensary in London, who published an "Inquiry into the Seat and Nature of Fever" in 1825. At this time and from now on it was evident that the view of the symptomatic nature of fever was spreading. Clutterbuck mentioned that there was some argument among physicians as to whether fever was wholly dependent upon inflammation, and commented that the Editor of the *Medico-Chirurgical Review*, for January, 1825, approved the idea that "fever is a disease of the whole system, mind and body; of all the organs, and all the functions; in the fluids, as well as solids; is omnipresent, and has no one pathognomonic symptom."[8]

He restricted the term *fever* to idiopathic fever and divided it entirely from the fever accompanying inflammation of various parts which he preferred to call pyrexia or symptomatic fever. He also insisted upon the seat of this idiopathic fever as being in the brain, a close approach to a later idea of Müller. His insight into the nature of fever was almost correct although he was misled into thinking it to be an affection of the brain. He stated: "While fever continues to be looked upon in the light of a general affection or disease of the whole system without any primary and determinate seat in the body, we can never hope to discover anything certain with regard to its intimate nature." Had he not been committed to the brain as a source of the fever, he might have contributed to the development of the correct understanding.

Later George Fordyce, Senior Physician to St. Thomas's Hospital, and Reader on the Practice of Physic in London, published his "Five Dissertations on Fever," (1846). In this he noted that:

> When a disease of a part of the body produces an affection of the whole system, in which there are many appearances similar to those which take place in fever; if upon removing such disease the affection of the system does not immediately go off, but begins to subside, and continues gradually to subside; such affection, for the same reason, cannot be called fever.[9]

Even in 1874, William Stokes, Regius Professor of Physic in the University of Dublin, in his "Lectures on Fever, Delivered in the Theatre of the Meath Hospital and County of Dublin Infirmary," stated that "fever is not symptomatic of the organic changes which may be found combined with it, but is rather the generator and governor of those affections. It is, then, a condition without any known or necessary local anatomical change."[10] He was aware of the attitude in France for he took occasion to scoff at the experience of Broussais and others in France alone and to intimate that had they been more widely traveled, particularly in Ireland, Scotland or England, they would not have fallen into the error of thinking that a special anatomical change characterized every case of fever. At this late date and despite the work of Gerhard and Bretonneau, he was unwilling to concede any essential difference between typhus and typhoid fever and believed that one might pass into the other.

In this country a much more enlightened attitude toward the nature of fever existed by the middle of the century. Elisha Bartlett, whose "History, Diagnosis, and Treatment of the Fevers of the United States" was published in Philadelphia in 1852, apparently realized the changing state of knowledge in this regard and he avoided as much as possible any discussion of the true nature of fever. Although Bartlett made the error of considering typhus an essential fever, his attitude was eminently an open and scientific one. Considering the theory of fever, he said at first under typhoid fever:

> The most positive thing that can be said under this title is, that the materials for a complete and philosophical *theory of fever*, or *theory* of any individual fever, using this phrase in its ordinary acceptation, do not exist. Such a theory presupposes and involves a knowledge of the intimate processes and relations of the living powers which has not yet been attained. It is very questionable even whether such knowledge is attainable.[11]

Later in discussing typhus fever he made the following rational remarks:

> In typhus, there is no constant and uniform lesion of the solids, to which the symptoms can be referred. We certainly have here, if nowhere else in the nosologies, a general disease; an *essential* fever. In regard to its theory, and especially to the primary and fundamental disturbance which, in its turn, gives rise to the subsequent and connected morbid phenomena, the sum of which constitutes the disease, British medical philosophers are mostly divided into two classes; the solidists and the humoralists. More strictly, we might call them the *neuropathists* and the *hemopathists*. The first maintain that the impression of the morbid poison is primarily made upon the nervous system; the latter maintain that this impression is made upon the blood. I do not propose to enter into any history of the reasons urged by the partisans of these respective theories in support of their opinions, or in any way to discuss their merits. I may be allowed to say that an undue degree of importance seems to me to be attached to them by their authors and advocates. They are at best only *explanations* or *interpretations*, more or less probable, more or less ingenious, more or less plausible, of the phenomena of fever, and of the various relations of these phenomena. Sydenham's, or Huxham's, or Cullen's may be as good as any of them. They are probably all of them more or less erroneous, they may be wholly so. Let us remember, besides, and a consolatory reflection this is, in the midst of these multiform and conflicting *theories*, that they constitute an element in medical science of very subordinate perhaps questionable value. The true science of fever is in its appreciable phenomena and their ascertainable relations, not in any explanation of the nature of these phenomena and these relations.[12]

In a footnote in this chapter he made a prediction that the next quarter of a century would witness a complete revolution in the temper and philosophy of British medical science. Considering that Stokes was probably the last eminent man in Britain to contend that fever was a separate entity, this prediction was remarkably accurate.

Returning to England, one more author may be quoted. George Gregory, Physician to the Small Pox and Vaccination Hospital at Highgate, in his "Lectures on the Eruptive Fevers" at St. Thomas's Hospital quoted Robert Williams who had published a book "Elements of Medicine. On Marked Poisons" in 1841, as saying that fever is the primary effect of a poisoning, affections of the skin and mucous membrane being the secondary effects of the poisoning, and the inflammation of internal organs its tertiary effect. Gregory, however, unfortunately disagreed with this and was content to dispose of the diagnosis of fever as follows: "When a man has a hot skin, a frequent pulse, a furred tongue, and a feeling of weariness, we say that he has an attack of fever."[13] He was still content to classify fever into the inflammatory, the nervous, the gastric, and the malignant types—a classification which now means so little that it is difficult to have an exact understanding of just what was meant.

The views already quoted were destined to be changed before long. The opinions which at intervals had given only a hint of the truth were to solidify about the symptomatic nature of fever by the last quarter of the century. The production of this change was dependent upon factors which may now be considered.

From the storm of the French Revolution emerged two figures destined to have much influence upon the ideas of fever. One was the master anatomist, Bichat, and the other, the brusque Broussais. In considering these two men it is illuminating to note the part which apparent chance may play in the ultimate place assigned to genius in history. Bichat's was one of the greatest minds of his time. Even his untimely death was too late to prevent the publication of his important work, for in his "Anatomie Générale," Bichat laid the foundation for tissue pathology as a cause not only for fever but also for all disease. The following paragraph shows his insight into the fundamental factors:

> There are always two orders of symptoms in inflammations: 1st. those that belong to the nature of the diseased tissues; 2d. those which depend upon the affected organ, in which the inflammation exists. For example, the kind of pain, the nature of the accompanying fever, the duration, the termination, etc. are almost always the same, whatever serous surface is affected. But difficulty of breathing, dry cough, etc. prove it to be the pleura; diarrhoea, constipation, vomiting, etc. that it is the peritoneum; injury of the intellectual functions, that it is the tunica arachnoides; irregular pulse, that it is the pericardium, etc. The first belong to the whole class, the second set of symptoms is confined exclusively to this or that particular sort; now the second are, if we may so say, accessory, depending upon the proximity of the affected tissue with some other tissue. The first are particularly important.[14]

The misfortune of this work was that it could not have been done a century earlier. The beneficial effect of these views upon medicine generally, could they have been pronounced at the beginning of the eighteenth instead of the beginning of the nineteenth century, can not now be estimated. Instead, after a brief period, tissue pathology was to be replaced by the cellular pathology of Virchow in 1858, effacing perhaps considerable luster from a man whose views, important as they were, came too late.

On the other hand, it is a matter of surprise to many that the name of Broussais should be so well remembered. It seems incredible that a man whose personality was overbearing and offensive, whose methods of treatment were suitable mainly to an army of Gargantuans, and whose theories concerning disease were wrong in all respects except one, should have been so quoted and his opinions held in such esteem as they were. This one exception, however, was the clue to the entire matter. It has already been noted that typhus fever, much later than Broussais, was considered by some to be an essential type of fever, that is a disease in which the symptoms and physical manifestations were due to fever alone. In his "Examen de la Doctrine Médicale," he spoke of it and other diseases as follows:

> One must regard as necessarily affected, in one disease, the tissues in which the irritation is constant during life, and in which traces are present after death. Or, the phenomena of positive-excitation of the mucous membranes, and especially of the gastric, never lacking, in typhus fever, since their symptoms are identical with those of sporadic gastroenteritis; while those of other phlegmasias are only found there accidently. Then, when persons affected with typhus fever have the misfortune of succumbing, one always finds these membranes red, dark, or black, while the other tissues only show alteration in certain accidental circumstances: hence, the irritation of the mucous membranes is inseparable from typhus fever.[15]

The value of this observation, of course, was in the localization of the disease to an organ or a tissue. Broussais' only claim to eminence lay in this one fact: that he helped dispel the vague beliefs, and rightly so far as the theory was concerned, but usually wrongly in regard to the pathologic condition, he insisted upon the localization of disease.

The medical schools of France had suffered in the general ruin of other institutions due to the French Revolution. A new growth occurred shortly which produced such men as Corvisart, Laënnec and Louis. The dethronization of the established order in France was to be followed in the next seventy years by the unification and development of a new Germany. Despite the failure of this political achievement in 1848, the medical profession in Germany could take advantage of this new growth, no matter what political obstacles the reactionary Metternich might interpose. The unification and political development of Germany in the first half of the century was a spiritual fact, if not an actuality. As a result of increased freedom and the enlightened public policy of expenditure of funds for scientific advancement, such progress was made that the German language became a necessary scientific vehicle by the middle of the century.

At the same time the industrial revolution in England had the remarkable result of increasing mechanical specialization, while it possibly decreased individual freedom. Unfortunately, in England the public attitude toward science was not in the direction of expenditure of money. What was accomplished was done very largely by individual effort and this perhaps accounts for the fact already noted that they were in general much later in understanding the symptomatic nature of fever.

If the profession was ready to make use of the benefits conferred by a changing political and industrial world, its members were no less able to avail themselves of the useful ideas in philosophy. The foundation of medical research in the nineteenth century may be said to date back to Roger Bacon. Just as many of the powerful forces producing the French Revolution owed their origin to Rousseau, who himself was unable to live up to the principles he advocated, so did the experimental method in medicine owe its origin largely to Roger

Bacon who himself was no experimentor. It is noteworthy that while the profession apparently adopted wholeheartedly the advice of Comte that the search for ultimate causes be abandoned and that attention be directed rather to the laws of phenomena as the only kind of knowledge attainable and useful, they were not misled by Berkeley's dissertations upon the unreality of matter. As a matter of fact the realms of pure philosophy were not attractive to the physicians of that day. The weight of authority had failed to solve their problems, no less than the attempts to reach ultimate understanding by pure ratiocination. They were, therefore, ready and eager for the demonstration of biologic laws by experimentation. Undisturbed by the sneer of Nietzsche that scientists are smug optimists who think science justified by its extension of creature comforts to the multitude, they believed with Kant that any concrete act of knowledge required both thought and sense, (scientific observation).

The appreciation that medical progress must come about by studying the laws of observed phenomena and by relating facts of knowledge to other facts shortly reached its first fruit in Claude Bernard, who may truly be called the founder of experimental medicine. If no other accomplishments had appeared in the first half of the nineteenth century other than the development of the methods of experimentation and the drawing of conclusions only upon the basis of observation and correlated experiment, this period would still rank as a most important epoch in medicine. Bernard was shortly followed by Johannes Müller, who was certainly the founder of scientific medicine in Germany. Although Müller was mistaken in his idea that fever was a nervous reflex, he gave marked impetus to the idea that it is a symptom. The tissue pathology of Bichat was followed by the cellular pathology of Virchow and thus the knowledge of the pathologic basis, not only for fever but for all disease, became firmly implanted and has not yet ceased to grow. With such a material basis, there were needed now only observers to correlate the manifestations of fever with the pathologic entities. Such observers were not lacking. Henle shortly elaborated Müller's idea and while still not quite correct in his conception, did much to further the appreciation of fever as a symptom. By far the most important work, however, was by Wunderlich, who, in his work, "Das Verhalten der Eigenwärme in Krankheiten," practically settled the matter of the symptomatic nature of fever. As Garrison says, "He found fever a disease and left it a symptom." This work was produced in 1869, and it should be noted that others were concerned in laying the foundation for this. The patient observations of Traube, who introduced the thermometer into his clinic in 1850, and who originated the now familiar fever curve, an indispensable part of all hospital records, contributed considerably to the success of Wunderlich. It has already been noted that as late as 1874 Stokes was still unconvinced of the symptomatic nature of fever. The introduction of Wunderlich's work and its translation in the new Sydenham Society's library in 1871, together with the interest and approval of Allbutt in the matter, gave a tremendous impetus to the proper evaluation of the place of fever.

It is striking that whereas there was considerable argument throughout the first three quarters of the century regarding the symptomatic nature of fever, the last quarter was conspicuous by an absence of such discussion. By the time Allbutt's "System of Medicine" was published in 1896, this argument was dead. The final steps toward its disappearance as a topic of discussion began with Henle's germ theory of disease in 1840. Bretonneau suggested the specificity of bacteria in producing illness in 1855 and added confirmation by his work in the differentiation of typhus from typhoid. How much influence the demonstration of the infectious nature of tuberculosis by Villemin in 1868 may have had, is hard to say, but the aid to the differentiation of bacteria by the introduction of solid culture media by Koch in 1870, the discovery of streptococci and staphylococci by Pasteur, and the demonstration of the malaria parasite in 1881 by Laveran, were practically final blows to the doctrine of the essential nature of fever. Against the rapid discovery of this or that organism, each producing a specific disease, this older idea could hold no ground.

By the beginning of the twentieth century, the status of fever as a symptom was well understood. Du Bois, Benedict, Barbour, and many others have turned from a consideration of fever as an entity to a study of its causation. The nineteenth century served to classify the subject and to place fever in a light more favorable to its understanding than all the preceding years. It remains for this century to unfold its actual nature and cause as a symptom.

References

1. Adams, F. The Genuine Works of Hippocrates. N. Y., Wood, 1886, 1: 307–308.
2. Long, E. R. Selected Readings in Pathology. Springfield, Ill., Thomas, 1929, p. 23.
3. Sarton, G. Introduction to the History of Science. Balt., Williams and Wilkins, 1931, 2: Pt. 2, 790.
4. Stoll, M. Aphorismes sur la Connoissance et la Curation des Fièvres. Publiés par Maxim. Stoll, et traduits en Français par P. A. O. Mahon. Paris, 1801, p. 2, Aphorismes 8 and 9.
5. Alibert, J. L. Traité des Fièvres Pernicieusee Intermittentes. Ed. 4, Paris, 1890, p. 1.
6. Boisseau, F. G. Physiological Pyretology or a Treatise on Fevers: According to the Principles of the New Medical Doctrine. 1st Amer. from 4th French ed., trans. by J. R. Knox. Phila., Carey and Lea, 1832, p. 63.
7. *Ibid.*, p. 68.
8. Clutterbuck, H. An Inquiry into the Seat and Nature of Fever; As Deducible from the Phenomena, Causes, and Consequences of the Disease, the Effects of Remedies, and the Appearances on Dessection. Ed. 2, London, 1825, p. vii of Preface.
9. Fordyce, G. Five Dissertations on Fever. 2nd Am. ed., Phila., Barrington and Haswell, 1846, p. 34.
10. Stokes, W. Lectures on Fever, Delivered in the Theatre of the Meath Hospital and County of Dublin Infirmary. Ed. by John William Moore. London, Longmans, Green, 1874, p. 35.
11. Bartlett, E. The History, Diagnosis, and Treatment of the Fevers of the United States. Ed. 3, Phila., Blanchard and Lea, 1852, p. 159.
12. *Ibid.*, pp. 322–323.
13. Gregory, G. Lectures on the Eruptive Fevers; As Now in the Course of Delivery at St. Thomas's Hospital, in London. 1st. Am. ed., N. Y., Wood, 1851, p. 11.
14. Long,[2] p. 135.
15. Broussais, F. J. V. Examen. de la Doctrine Medicale. Pp. 23–24 of Southwood Smith's A Treatise on Fever. London, 1830.

HISTORIC BACKGROUNDS OF ORTHOPEDIC SURGERY*

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AS the developments and attainments of modern surgery are studied, and its divisions and specializations considered, it is easy to overlook the distant past of each of these branches and to forget their collateral ancestry. The legacy from primitive surgery is not great and the debt to the surgeons before Lister's time may be easily paid; yet even so, there is still intense fascination in tracing and discovering the poignant contributions of all our progenitors.

ANCIENT SURGERY

The neurosurgeon of today beholds his earliest predecessors in those unknown prehistoric medicine men who trephined the skulls of men of the neolithic age 10,000 years ago. Plastic surgery saw its birth in the early rhinoplastic operations performed by the ancient Hindus, and the ophthalmologists are the heirs to the skilful Greek, Antyllus, who mentioned removal of cataract by extraction and suction.

But more ancient than any of these are the earliest evidences of techniques which began the evolution toward two great modern branches of surgery, genitourinary and orthopedic. Lost in the mists of antiquity is the story of the origin of the operation of circumcision, the first distinctly specialized urological surgical procedure, and likewise, another rite, amputation of the fingers, a distinct orthopedic problem, goes back at least to the late paleolithic age (25,000 years ago) as evidenced by primitive drawings on the walls of paleolithic caverns in Spain.[7]

A striking parallelism continues further in the knowledge of the historic backgrounds of these two major specialties. Except for the primitive circumcision knives discovered in Egypt, the earliest surgical appliances known are the splints found by the members of the Hearst Expedition on two mummies in the same tomb at Naga-ed-der. Smith examined these bodies, which were judged to be 5000 years old, and in one body, that of a girl, aged about fourteen years, there was a fracture in the middle third of the femur (Fig. 1), and in another, fracture of both bones of the forearm. These members were splinted by wooden strips wrapped in linen with padding of coarse grass and the whole bound by linen sheets. Apparently the early orthopedists made no effort toward extension; however, criticism is unjustified when one considers the efficacy of such splints for immobilization and the singular thoroughness with which they are applied. Nevertheless, in an extensive study of paleopathology in Egypt, Sir Armand Ruffer concluded that the final results of treatment of fractures in ancient times was bad, and that the frequency of malunited and ununited breaks was high.

Again the earliest portrayal extant of surgeons at work combines the backgrounds of these two specialties.

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Max Müller,[4] in 1904, explored a tomb at Lôret, near ancient Memphis, and there found a sculptured panel believed to date not later than 2500 B.C. (4500 years ago). Here in the upper panels (Fig. 2) were pictured the surgeons at work on the hand, foot, and knee of their several patients, and in the lower rows of illustrations, the genitourinary surgeons of a bygone age were apparently cutting for chordee or performing circumcision on two adults. In the accompanying hieroglyphics are manifested intimate sidelights of the problems of primitive practice. How familiar to us all is the cry of the patient, "Do this and let me go!" or "Do not hurt me thus!" and equally characteristic in its calm and respect for authority, is the surgeon's reply, "I'll do as bids me the king."

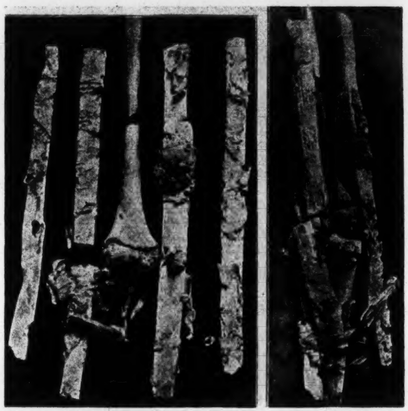
FIG. 1. EARLIEST SPLINTS APPLIED TO FRACTURED FEMUR. FROM EGYPTIAN MUMMY OF THE FIFTH DYNASTY. (FROM ELLIOT SMITH.)

Furthermore, in the King James version of the Bible, only two surgical procedures are mentioned which at the same time depict the beginnings of our modern orthopedics and urology. Circumcision, of course, is frequently referred to; for as a sacerdotal rite among the Hebrews, it maintained an important position in their traditions. Likewise, in Ezekiel 30:20. is a casual consideration of the current treatment of fractured extremities for it is stated: "Son of man, I have broken the arm of Pharaoh, King of Egypt, and lo it shall not be bound up to be healed, to put a roller to bind it, to make it strong to hold the sword."

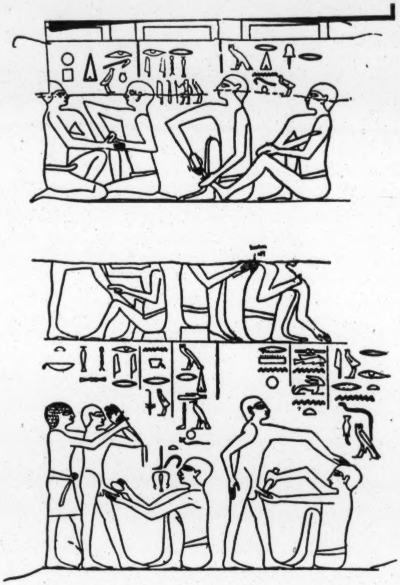
FIG. 2. EARLIEST ILLUSTRATION EXTANT OF SURGEONS AT WORK; 2500 B.C. (FROM WALSH.)

Henceforth the subsequent story of genitourinary surgery passes to those chapters describing the charlatanism of the uroscopists (water doctors) and the adroit maneuvers of the pre-Listerian lithotomists on its path to the final story of the complete specialty today. Likewise the narrative of the progress of orthopedics engrosses in passing the indispensable services of the early army surgeons and the unquestioned adeptness of the bone setters and brace makers who contributed to the composite background of the present-day orthopedic surgeon.

In the surgical thinking of primitive man, orthopedics indubitably played an important part. Human life was essentially violent and disordered so that in the pursuit of food, the defense of homes, and the conquest of enemies, our ancestors frequently must have experienced fractures, dislocations, and other injuries of the extremities. Smith has pointed out that since time immemorial the Egyptian native has habitually carried a "naboot," a thick heavy staff about 5 feet long, which he utilized for sport or for more serious acts of defense.[29] This weapon, by its very antiquity and usefulness, was no doubt a most prolific source of cracked heads and fractured forearms. Those of you who heard Lord Moynihan's historic address in August, 1930, recall that he determined the shrewish irascibility of the mother of King Tutankhamen by discovering a poorly-united fracture of one of her metacarpal bones. This injury, he explained, is produced almost always by striking with the closed fist and is a common sequel to domestic brawls. What with the queen-mother settling altercations by fisticuffs and her subjects commonly wielding heavy clubs, we must reiterate that life among the ancients was unquestionably violent!

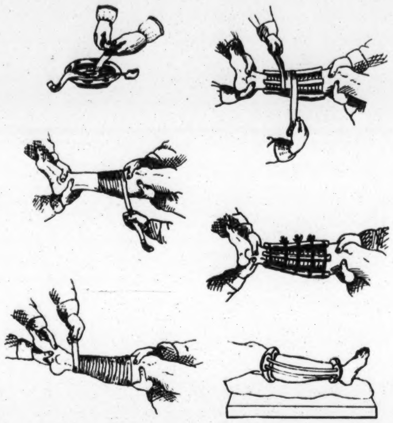

Fig. 3. Cerate Bandage Described by Hippocrates. After Scultetus. (From Milne.)

The war wounds in ancient times, however, were not so important orthopedically for, until the introduction of gunpowder in the thirteenth century, injury to bones was much less common. Wounds from lance, spear, and arrow engendered much infection and loss of life, but it is significant that of the 250 wounds mentioned in Homer[8] with a mortality of 75 per cent, there was not a single case of loss of limb.

Hippocratic Era

From the time of Hippocrates onward, surgical writings were not complete without a considerable portion being devoted to the subject of fractures, dislocations, and other problems encompassed in modern orthopedics. In the Hippocratic writings preserved for us today, the four treatises ("On the surgery," "On fractures," "On the articulations," and "The mochlicus") relating to these subjects comprise more than a third of the total. Adams, the translator, summarized: "When we reflect on the admirable manner in which the whole subject is handled, and the many important truths which are evolved in the course of it, we cannot surely but regard with veneration the labors of our forefathers."

Hippocrates, after a casual review of the structure and function of the skeletal system, proceeded directly to consider the care of injuries and disease sustained by it. His consideration of dislocated shoulder is superb and was matchless until modern times: "When, then, a dislocation to the armpit takes place, seeing it is of frequent occurrence, many persons know how to reduce it, for it is an easy thing to teach all the methods by which physicians effect the reductions, and the best manner of applying them." Follows then a detailed description of four successful maneuvers including the use of the heel in the axilla (a familiar technique to us all) and the "method with a ladder." In the latter method he explained that "some round thing should be tied upon the step of the ladder which may be fitted to the armpit, whereby the head of the bone may be forced into its natural place" and then, with the wrist secured to it, the ladder is forced downward to the vertical position. However, caution was advised in any methods of treatment since "it should be known that one constitution differs much from another as to the facility with which dislocations in them may be reduced."

Hippocrates,[1] in this connection, devised and described minutely his scamnum, an effective mechanical contrivance for extending limbs and bodies. He said: "By means of such machines and of such powers it appears to me that we need never fail in reducing any dislocation at a joint." Not altogether unjustified optimism is this, however, when we study the mechanical powers enlisted. He counsels that "there are many methods of making extension. But the best thing is for any physician who practices in a large city, to have prepared a proper wooden machine, with all the mechanical powers applicable in cases of fracture and dislocation, either for making extension or acting as a lever."

After reduction is complete, the instructions for immobilization of fractures are excellent. "When they are extended, the physician should apply the palms of his hands and adjust the fractured parts, and then having rubbed the parts with cerate . . . it is to be bound up in this state." This cerate dressing (Fig. 3), antedating the plaster-of-Paris cast by 2000 years, was a very tangible contribution to surgery and, if it was generally utilized, a source of much benefit for centuries.

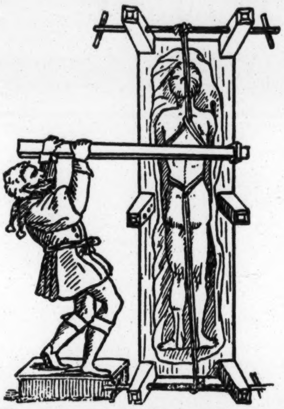

FIG. 4. REDUCTION OF GIBBOSITY OF SPINE BY SCAMNUM. (AFTER MILNE.)

Spinal deformities, with "subluxations" or "gibbosities," called also for extension and correction by these, as we see them today, enormous forces. Traction in the scamnum (Fig. 4), accompanied by levering directly over the bony prominence, was an accepted standard and may even have been of benefit in some cases of Pott's disease with kyphosis. Moreover, the succussion treatment for spinal deformity was of even greater severity and, although Hippocrates carefully explained it, there is at the same time a strong condemnation. "Wherefore succussion on a ladder has never straightened anybody, as far as I know, but it is principally practiced by those physicians who seek to astonish the mob. . . . But the physicians who follow such practice, so far as I have known them, are all stupid." However:

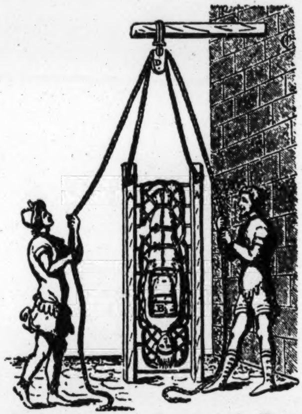

FIG. 5. SUCCUSSION ON A LADDER FOR DISLOCATION OF SPINE AS DESCRIBED BY HIPPOCRATES. (AFTER MILNE.)

> If one should think of trying succussion, it may be applied in the following manner [Fig. 5]. The ladder is to be padded with leather or linen cushions laid across . . . (the patient) is then to be laid upon the ladder upon his back and the feet, at the ankles, are to be fastened, at no great distance from one another, to the ladder with some firm but soft band. . . . When you have arranged these matters thus, you must hoist up the ladder either to a high tower or to the gable end of a house; and then let go so that it falls straight downward and lands squarely.

Little hope of success is held out, though, and the practitioner is warned of probable failure. Also, he concluded sagely: "It is disgraceful in every art, and more especially in medicine, after much trouble, much display, and much talk to do no good after all."

The teaching by the "Father of Medicine" of orthopedic principles could afford countless other illustrations, for of all the Hippocratic writings, these are the least ephemeral, the most accurate as judged by present standards, and withal the most valuable to subsequent generations. In short, these treatises, so briefly considered here, comprise the greatest single contribution to the historic background of orthopedic surgery.

Of the several commentators who borrowed heavily from Hippocrates in succeeding centuries, none was able to add appreciably to the portion on traumatic surgery which has just been reviewed. Galen described the "glossocomium," an instrument developed by the practitioners of his day for traction and countertraction to extremities, yet it was little different from Hippocrates' device. Paulus Aeginata added the details of a box splint made of wood or earthenware for the lower extremity.[16] This improvement had many points of definite advantage and was, as a matter of fact, in common use until less than a generation ago. Albucasis, the eleventh century Arab physician, published his great treatise on surgery which included more additional details such as the mention of paralysis following fracture of the spine. He also acknowledged his profound debt to the writings of Hippocrates.

MEDIEVAL ORTHOPEDICS (MILITARY SURGERY AND QUACKERY)

In the long centuries of medievalism which followed in the wake of the downfall of Rome, the intellectual and ethical standards of contemporary surgery were debased almost to the point of extinction. Following the tendency of Galen to dissociate surgery from medicine, the Arab physicians degraded even more the lot of the surgical operator. Hence in an era of empiric medicine, the few surgeons who meet the eye are personalities who stand forth by sheer force of will or by the vigor of their preserved writings. The high water mark of medieval medicine was without question reached at the great school of Salerno; yet, even here, surgery received scant attention.

Two brilliant exceptions in this period of decadence, Henri de Mondeville and Guy de Chauliac, were each surmounters of great obstacles and each has left us an outstanding surgical treatise.[19] Although Mondeville was the first to write such a treatise, his book was not printed until almost 600 years after it was written. Fighting the rapid progress of pulmonary tuberculosis, he completed the first three parts (I. Anatomy; II. Wounds, and III. All surgical maladies except wounds, ulcers, and affections of bones) of his work in 1314, but Part IV which was to encompass fractures, dislocations, and the affections of bones was abandoned in the face of his overwhelming malady.

Thus, in despair, he begins the introduction to the last part, "I cannot live long, being asthmatic, coughing, phthisical, and in consumption" and at that point his efforts cease. So, dying in harness, he bequeathed to us his incompleted works which unfortunately skipped the section that would have revealed the orthopedic practice of his age.

Happily de Chauliac[3] affords a striking contrast in this connection. His "Great Surgery," a far more distinguished authority, is preserved intact and the section "On wounds and fractures" is fascinating by its very clarity and its anticipation of modern methods. Tradition has it that the boy Guy de Chauliac was taken under the patronage of the barons of Mercoeur as a consequence to a rare caprice of fortune. A lady of the household had fractured her leg in a hunting mishap and, all other means proving unsatisfactory, an oracle was consulted for advice. The reply was that cure should be effected by "an unlettered rustic" and by accident the choice fell on young de Chauliac. His mechanical intuition, acute enough to procure satisfactory results, ensured his future, for he was sent to Toulouse, Montpellier, Bologna, and Paris to secure the best medical education available at the time. His later life as physician to the popes of Rome, we can mention only in passing. The magnum opus, the "Great Surgery" written in 1363, the "solace to his old age," described the ligature, cautery, and compression bandage with marked distinctness two centuries prior to the time of Paré, himself the accredited "Father of modern surgery" and the reputed founder of the technique of ligation.

But, to us, the chapters devoted to diagnosis and treatment of fracture are found to be even more interesting, incredibly accurate, and timely in their delineations. When de Chauliac stated that in the late stages of fracture healing "callus is engendered . . . with the help of God," few of us would take exception and fewer still could offer appreciable supplementary details to that incontrovertible fact. His portrayal of the physical signs of fracture is excellent and his warning of the dangers of infection specious. De Chauliac divided the purpose of treatment of fracture into four parts: first, to equalize (reduce) the bone; second, to preserve the equalized bone; third, to bind it with callus, and fourth, to remedy complications. Reduction is to take place by manual traction until the fractured limb is restored, "using the healthy limb as an exemplar," then it is to be splinted with light willow strips. After splinting, "let one have a cradle or suspensory in which the limb will be firmly and evenly placed . . . a mattress bed on which the patient sleeps and, if it is necessary, let it be perforated so that he may go to stool . . . [and have] a cord hanging over the bed or some other thing for him to catch and help himself when he wishes to go to stool or straighten or turn himself."*

To cite a few other general recommendations; in fracture of the ribs he advises that the thorax be bound tightly; in fractured jaw, the teeth are to be wired together with gold thread, and spinal fracture is considered to warn against neglect of signs of involvement of the central nervous system and the dangers manifest by urinary and fecal incontinence.

In summarizing, then, it seems inconceivable that these instructions and precautions should have been set down more than 500 years ago when one considers other contemporary practices and the status of the surgeons of de Chauliac's day. But of more compelling interest than any procedures already cited is the mention of traction by weights, the first I have been able to discover. "With regard to myself," he said, while considering fracture of the hip, "the thigh being bound with long splints to the feet. . . . I attach to the foot a leaden weight, passing the cord over a little pulley so that it will keep the leg in its proper length."[3] This, to me, is one of the finest passages in orthopedic history and a just cause for profound veneration of Guy de Chauliac, the Father of French surgery.

Although the works of two great medieval surgeons and writers have just been reviewed, it is necessary to remind one's self that most of the operations performed in these centuries were by the army or field surgeons who followed the troops that were at battle. These generally were men of far less ability or culture. The care of the wounded fell, in Roman times, to the hands of an army physician of very low rank. As a matter of fact, in the time of the Emperor Augustus[26] these practitioners were humiliated in the eyes of the soldiers by being forced to bear a slave name. When, in the twelfth and thirteenth centuries, the barber-surgeons came into being, they were also enlisted to serve in the menial capacity as camp surgeons to the current military leaders. Senn stated: "many of them, besides practicing their healing art, were required to serve in the ranks as privates and as servants and ordinary barbers to their officers. Many of them lacked elementary education and had no idea of anatomy and the art of surgery. Most of them came from the lower walks of life imbued with a servile spirit and without originality of thought." Until the sixteenth century, the barber-surgeon was little better than a craftsman. The physician was supreme in both medicine and surgery, and to him went the privilege of deciding when operations should be required and who should do them. The contemporary surgeon, to whom the technical problems were referred, possessed little more than a most superficial knowledge of anatomy and some manual dexterity with the knife. The outstanding practitioners of this age, in which surgery was the prerogative of the camp physician or in civil life the quack, were Felix Würtz (1518–1575) of Zurich, Ambroise Paré (1510–1590), barber-surgeon to the King of France, and Robert Clowes (1540–1604), Peter Lowe (1550–1610), and Richard Wiseman (1620–1676) in England. Their additions to orthopedics, however, were meager and their fame rests on other pedestals. Nevertheless, a gem worthy of note, is a passage in rhyme from Würtz[20] ("Surgical Practice," 1563) wherein splinting for fracture is described:

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* An excellent description incidentally of our present-day "Balkan frame."

Bind the patient not too strong,
Else he's choak'd and his bloode gone;

....

In the binding be very cautious,
Not too hard, nor yet too loose;
The band must hold the fracture stiffely,
Yet the pulse must have its way thoroughly.

Few of the strictly military surgeons of this or subsequent eras can be credited with major contributions to the practice of orthopedic surgery, although in all major combats, including the World War, their department has initiated much needed reforms in the care of injuries to the extremities. For example, centuries later, Napoleon's army surgeon, Baron Larrey, introduced into Europe the fixation bandage which was to develop into the plaster cast of today. During the campaign of 1798–1799 in Egypt, he observed the Arabs using a stiff bandage of straw covered with a mixture of egg-albumen and lead-water.[27,28] Apparently this appliance was little changed from the original cerate bandage described by Hippocrates for immobilizing fractured extremities. But once suggested to European surgeons, the idea evolved rapidly. Suetin, of Brussels, suggested starch paste as a fixative, Schultz, of St. Petersburg, modified it further by using salicylate of soda and, finally, in 1852, Matthysen, a Hollander, first proposed and utilized plaster-of-Paris for the supporting bandage. Here, then, in brief, is the story of development of the most indispensable appliance in the armamentarium of modern orthopedic surgery which was brought from the ancient world by a military surgeon.

Apart from the actual surgery of the limbs, the development of prosthetic or artificial appliances also owes a great debt to the army surgeons of the past. In addition to the enormous loss of limbs from anesthetic leprosy or ergotism in the Middle Ages, or from judicial or inquisitorial mutilations, there was on the battlefield an appalling number of amputations performed for grave lacerating injuries.

Obviously, and most commonly, reconstructive suggestions came from the military surgeon who encountered these cases so frequently. To cite a few outstanding instances, the elder Pliny mentioned that Marcus Sergius, the great-grandfather of Catiline, who lost his right hand in the second Punic War, later fashioned a hand of iron to supplant it.[8] A very celebrated appliance also was made for Götz von Berlichingen (the robber-knight of the sixteenth century who is described to us in an early drama of Goethe) to replace his right hand, lost by musket shot at the siege of Landshut in 1504. Ambroise Paré enlisted the skilful aid of the armorer[12] to produce several of his noteworthy corrective devices. His "corselet for the correction of a twisted body" and the "little boots" for the treatment of deformities of the legs "of which the sufferers are called Vari and Valgi and for too weak or slender legs," are valuable contemporary addenda. In Napoleonic times, Larrey, Surgeon-General von Langenbeck, and Graefe, all army surgeons who witnessed the frightful destruction of limbs, were very cogent factors in hastening the progress of prosthesis.

Allusion has been made to another group of practitioners, the bonesetters,* who also contributed much to the historic background of orthopedic surgery. Unfortunately, the descendants of these mechanotherapists, far from supplementing modern medicine, are today the major menaces of legitimate practice and the bulwarks of quackery. In ancient Greece and Rome, the gymnasiums and public baths were widely distributed and largely patronized. Heat, massage, hydrotherapy, and manipulative procedures were doubtless practiced extensively and the operators must have become quite skilled. However, the gymnast soon overstepped his sphere and began to treat all bodily ills by this mechanotherapy. In Greece, these men enlisted the aid of scribes to compose paeons of praise to their abilities, which I suppose are the first solicited testimonials of the irregular practitioner. There followed a flood of quackery so extensive that, in Galen's time, he compared the Roman physicians to a band of robbers. The tendency spread and, in those days of unregulated medicine it was difficult to distinguish the physician or surgeon who had completed the required studies of the times.

Black magic also was added to the tenets of this profession, and, in later centuries, the public executioner, whose communion with the gods of darkness was more intimate, was recognized as a healer of merit. In Saxony, the executioner was an authorized practicing bonesetter as late as the eighteenth century.

Nevertheless the physicians and surgeons of the sixteenth and seventeenth centuries can share much of the odium of this new growth for they fostered the development of bonesetters to avoid the frightful mortality that accompanied any type of surgical maneuver done by themselves. Pierre Franco ("Chirurgie," 1561) tells that the surgeons, afraid to operate, often employed the quacks. "In some towns," he added, "the surgeons have their bonesetters thinking it degrading to reduce a dislocation or set a fracture." Even the great Cheselden described a cure of clubfoot by "Mr. Presgrove, a professed bonesetter then living in Westminster," and he admitted, "I recommended the patient to him, not knowing how to cure him myself." In a village near Moscow, as late as 1781, lived a peasant so very skilled in manipulative procedures that Catherine the Great decreed that pupils of the great War Hospital at Moscow should study with this peasant, two at a time, for two months each.

In England, for 200 years, the lore of bonesetting was passed from generation to generation (an apparent essential to the acquisition of this quasimedical skill) in the Taylor family and other families of Lancashire. They were the source for most of the ensuing flood of practitioners in that country, including the celebrated and wealthy Mrs. Mapp of Epsom. She it was whom Percival Pott described as "an illiberal drunken female savage" and who occupies the upper central position in Hogarth's caricature, "The Company of Undertakers."

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* Ref. 5, 6, 9, 13, 18, 21, 22.

A similar family prospered in this country, and for several generations, the progeny of Job Sweet[4] in Rhode Island and Connecticut were locally famous as bonesetters of renown. The genius of the clan, Benoni Sweet, carried on an extensive and lucrative consultation practice in New York City in his later years, and at one time numbered Governor De Witt Clinton among his patients.

It is not of interest to pursue further the extension of bonesetting into the many cults of mechanotherapy as they are seen today. Nevertheless the bonesetter, of venerable memory, doubtless introduced many of the procedures which are now recognized in orthopedic surgery, or at least in the practice of physiotherapy.

ADVENT OF ORTHOPEDIC SURGERY

At last the beginning of modern orthopedic practice is reached, the era in which the treatment of fractures and dislocations is no longer the entire field and in which amputation ceases to be the sole operation of consequence. From thence, its growth may be followed until the advent of antisepsis in surgery where the historic phase ends and the present-day practice of the specialty begins.

Orthopedic surgery had its advent in Holland late in the seventeenth century when the first bone-graft operation, and the first tenotomy for the correction of deformity were performed. Jobi Meekren,[14] in 1682, transplanted a piece of bone from the skull of a dog into a defect in a soldier's cranium produced by injury in battle. Healing was perfect, although when the church got wind of this infamy, they required Meekren, under ban of excommunication, to remove the portion of foreign bone. Three years later, in 1685, Isacius Minius, another Dutch surgeon, severed the tendons in the neck of a twelve-year-old boy to combat the deformity of wryneck.[25]

The following century the specialty received its generally accepted name and, although it leaves much to be desired, it is doubtless permanent. Nicholas André (1685–1742), professor of medicine at the University of Paris, published a manual in 1741 on the prevention of deformities in children by corrective exercises. For the title he coined the term, "Orthopaedia" which, although limited in scope, has now come to encompass the entire field of bone and joint surgery.

A less famous contributor and one whose name is associated with no outstanding innovations was Jean André Venel (1740–1791) who is credited with the founding of orthopedic surgery in 1780 at his orthopedic institution at Orbe, Switzerland, the first of its kind in existence.

Far more timely was the development in France fostered by Jacques Delpech (1777–1832), professor of surgery at Montpellier. His thorough volume "L'orthomorphie," published in 1828, was a complete study and description of deformities of bone and joint. With the aid of friends, he established an idyllic orthopedic institution at the edge of the city where his theories of treatment were put into effect in classic sylvan surroundings.[11,17] He also described the beneficial effect of section of the Achilles tendon for the deformity of clubfoot, which operation he performed in 1816. Although this operation had been done previously by Lorenz of Frankfort in 1782, by Scarpa in 1803, and by Sartorium in 1812, it fell to Delpech to reveal to the medical world the value of tenotomy in correcting contracture deformities in extremities.

The therapeutic worth of massage and graded exercises was further promulgated in Stockholm, about 1813, by Pehr Henrik Ling (1779–1839), although the rise of "Swedish massage" methods is of slight import here.

INFLUENCE OF STROMEYER

The teachings of Delpech were developed, extended, and widely disseminated through Georg Freidrich Louis Stromeyer (1804–1876) who, after studying his principles, devoted his life to the correction of deformities. Stromeyer, a young Hanoverian, was professor at Freiburg and Munich, and later surgeon-general of the Hanoverian armies. Successful tenotomy for clubfoot in 1831 established his fame, and soon the hospital at Hanover became the fountain head for the promulgation of the rapidly growing art of orthopedic surgery. Pupils of Stromeyer were the founders of the great orthopedic groups in London, Paris, Boston, and New York, and to him is due a great tribute as the pioneer teacher of this specialty.

Ditmold[2] introduced the principles of Stromeyer to New York at Bellevue Hospital in 1841. His contemporaries in that city (Louis Bauer, Lewis Sayre, Henry Davis, and Charles F. Taylor) were all affected profoundly by the theories of Stromeyer that subcutaneous tenotomy was a valuable cure of bodily deformities. This school was represented in Paris by Jules Louis Guérin (1801–1886) with whom Valentine Mott of New York studied for three years. After his extensive work at Paris and Hanover, Mott was immensely enthusiastic for the future of this new specialty. He prophesied that "as the discovery of Jenner has rid the world of a loathsome pestilence and banished from our sight those disfigurations which made the most lovely lineaments and complexions hideous to behold, so will orthopedic surgery, by its magic touch, unbind the fettered limbs (and) restore symmetry to the distorted form." On his return to this country, he conceived the development of a large orthopedic sanitarium in New York, but his death disrupted the plan.

And now this story approaches its finish in the similar careers of two great pioneer orthopedic surgeons who absorbed the tenets of Stromeyer and transported them to their respective countries, England and America, namely, William John Little (1810–1894) of England, and Buckminster Brown (1819–1891) of Boston. Both were crippled from childhood and were intensely interested in the alleviation of their deformities, both studied at Hanover for a time, and each initiated in his homeland the first orthopedic surgical clinics of consequence. These men deserve great commendation for their inception of two outstanding present-day orthopedic centers in the world.

In early childhood, one of Little's lower extremities became palsied and deformed; the condition has been described as a typical clubfoot. Not to be thwarted by such a physical handicap, he consulted Delpech at Montpellier and operation was discouraged. Later, however, he saw Stromeyer, who, in July 1836, severed the Achilles tendon and achieved a fairly satisfactory result. Little was vastly impressed, and on his return to England in 1838, he set about to establish the Orthopedic Institution (later the Royal Orthopedic Hospital) of London. In the first ten years of the life of this great charity more than 12,000 patients were treated and its noble service has been carried on until the present day by the descendants of the founder. Furthermore, the contributions to orthopedic surgery from London, Edinburgh, and Liverpool in ensuing decades are in themselves tributes to the profound and lasting influence of William John Little, Great Britain's first eminent orthopedist.

In New England, orthopedics began in 1838, when John Ball Brown[2,6] of Boston undertook the care of nine cases of spinal disease in a small private sanitarium. His interest in the subject had been aroused by the gross incompetence of the practitioners of his day to care for his son, Buckminster Brown, and he had cast about for all the related information obtainable. Buckminster, at fourteen years of age, fell on the ice* and was an invalid for a number of years. Throughout this period father and son applied themselves vigorously to the study of orthopedics and became possessors of superior knowledge in the field. Buckminster Brown, in 1844, received his medical degree from Harvard, and for two years studied with Stromeyer and his proteges, Guerin and Little. On his return to Boston he assumed the orthopedic portion of his father's practice and established himself as the first orthopedic surgeon in this country to devote his professional life to the specialty. Fifteen years later, at the Home of the Good Samaritan, he developed in 1861 a special ward for the exclusive treatment of deformity. This was the first orthopedic clinic in America and the inception of the great New England school of orthopedists. In his will, Brown provided for a professorship of orthopedic surgery at Harvard and this fact, coupled with the succession of able teachers who have held the post, are ample evidences of the far-reaching effects of Buckminster Brown.

Of the later developments of this art, many are cognizant and the field has been well surveyed by Keith[10] and Osgood.[17] But with this conclusion to a brief review of the historic backgrounds of orthopedic surgery, many characters of compelling interest have been found, and veneration for our forebears has, I hope, been correspondingly heightened.

REFERENCES

1. ADAMS, F. The Genuine Works of Hippocrates. N. Y., Wood, 1886, vol. 2, 366 pp.
2. BRADFORD, E. H. The President's address. *Tr. Am. Orthop. Assn.*, 2: 1–18, 1889.
3. BRENNAN, W. A. Guy de Chauliac (A.D. 1363) on Wounds and Fractures. Chicago, Brennan, 1923, 154 pp.

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* In an obituary of Buckminster Brown, John Ridlon mentioned a fall on the ice at the age of fourteen years which precipitated some form of hip disease. However, in a recent communication, Dr. Ridlon wrote, "I saw Buckminster Brown only once, and that was in 1888; and that is forty-three years ago. Dr. E. H. Bradford took me to call on him at his residence. . . . I only remember a frail little man sitting at his desk. I have the feeling that he was a cripple; but do not remember any deformity."

Dr. Robert Osgood, of Boston, has kindly supplied this additional information: "I am quite sure that Dr. Bradford once told me his (Brown's) trouble was an old Pott's disease and I have consulted Dr. Brackett and Dr. Augustus Thorndike who are of the same impression."

4. Comstock, J. On the study of living anatomy. *Boston M. & S. J.*, 49: 500 (Jan. 18) 1854.
5. Fischer, G. Surgery one hundred years ago. *J. A. M. A.*, 28: 308–313 (Feb. 13) 1897.
6. Fox, R. D. On bone-setting (so-called). *Lancet*, 2: 843–845 (Nov. 18) 1882.
7. Garrison, F. H. An Introduction to the History of Medicine. Phila., Saunders, 1913, 763 pp.
8. Garrison, F. H. Prosthetic appliances in war-time (historical résumé). *Mil. Surgeon*, 39: 507–509 (Nov.) 1916.
9. Hood, Wharton: On the so-called "bone-setting," its nature and results. *Lancet*, 1: 336–338 (March 11) 1871.
10. Keith, A.: Menders of the Maimed. London, Oxford Univ. Pr., 1919, 335 pp.
11. King, D. Hereditary skill in bone-setting. *Boston M. & S. J.*, 50: 12–15 (Feb. 1) 1854.
12. Little, E. M. Orthopaedics before Stromeyer. In: The Robert Jones Birthday Volume. London, Oxford Univ. Pr., 1928, 434 pp.
13. Lynn-Thomas, J. Bonesetters versus the science and art of surgery. *Brit. M. J.*, 2: 222 (Aug. 7) 1920.
14. Meekren, J. Chirurgicum ossis cranii fragmentum anferre jussit, sicque, curatione alia adhibita excommunicationis vim effugit. Jobi A. Meekren observat medico-chirurg. Ex Belico in lat. transl. of A. Blasio, Amsterdami 1682. pp. 6–7. Quoted by Janeway, H. H. Autoplastic transplantation of bone. *Ann. Surg.*, 52: 217–228, 1910.
15. Milne, J. S. The apparatus used by the Greeks and Romans in the setting of fractures and the reduction of dislocations. *Interstate M. J.*, 16: 48–60, 128–140, 1909.
16. Osgood, R. B. Backgrounds of orthopaedic surgery. *J. Orthop. Surg.*, 3: 259 (June) 1921.
17. Osgood, R. B. The Evolution of Orthopaedic Surgery. St. Louis, Mosby, 1925, 70 pp.
18. Paget, J. Cases that bone-setters cure. *Brit. M. J.*, 1: 1–4 (Jan. 5) 1867.
19. Pilcher, J. E. Guy de Chauliac and Henri de Mondeville, a surgical retrospect. *Ann. Surg.*, 21: 84–102, 1895.
20. Pilcher, L. S. Felix Würtz and Pierre Franco, A glimpse of sixteenth century surgery. *Ann. Surg.*, 24: 505–534, 1896.
21. Quackery in the past. *Brit. M. J.*, 1: 1250–1263 (May 27) 1911.
22. Read, W. Some notable quacks. *Brit. M. J.*, 1: 1264–1274 (May 27) 1911.
23. Ridlon, J. Buckminster Brown M.D. of Boston. *N. Y. M. J.*, 55: 272–273 (March 5) 1892.
24. Ruffer, M. A. Studies in the Paleopathology of Egypt. Chicago, Univ. Chicago Pr., 1921, 372 pp.
25. Sayre, L. A. The history of orthopaedy. *N. York M. J.*, 37: 116–118 (Feb. 3) 1883.
26. Senn, N. Ancient military surgery. *Surg. Gynec. Obst.*, 4: 690–700 (June) 1907.
27. Senn, N. Modern military surgery. *Surg. Gynec. Obst.*, 8: 113–120 (Feb.) 1909.
28. Senn, N. The evolution of the military surgeon. *Surg. Gynec. Obst.*, 8: 393–400 (April) 1909.
29. Smith, G. E. The most ancient splints. *Brit. M. J.*, 1: 732–734 (March 28) 1908.
30. Walsh, J. J. First pictures of surgical operations extant. *J. A. M. A.*, 49: 1593–1595 (Nov. 9) 1907.

INFANT WELFARE LAWS IN FRANCE IN THE EIGHTEENTH CENTURY*

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THE acquisition of a small collection of eighteenth century French law proclamations has drawn the author's attention to the state of the infant welfare movement in that country during the period from 1700 to 1800. Through a study of these proclamations one may learn of the changes in the care and treatment of foundlings and the children of the poor, and of the regulations concerning wet nursing. (Fig. 1.) At the suggestion of Dr. Ruhräh a short account of the general economic state of France during the eighteenth century is given as a background.

ECONOMIC STATE OF FRANCE IN THE EIGHTEENTH CENTURY

At the time of the death of Louis XIV in 1715 the annual deficit of France was sixty-five million francs. The peasants were at the mercy of the tax collectors; for example the Royal Salt Tax was twelve times the value of the article taxed. In addition there were many local taxes such as those on wood, water and forage. It was illegal to possess a mill or baking oven of one's own; all milling and baking had to be carried out in the manorial oven. By 1780 the country was nearly bankrupt. The farmers and peasants were most oppressed. Of every one hundred francs they gained, fifty-three went to the King and Country, fourteen to the landlord and fourteen to the church, leaving nineteen for feeding and clothing themselves and their families. The poor alone paid toll; they alone paid the immense expenses of state, army, law and church. Men of less than noble birth were no longer allowed to take rank as officers in the army.

To save the country from bankruptcy Parliament, which had not met since 1614, was convened. The 89 per cent of the population comprising the Third Estate was allowed half the representatives, the other half being divided between the nobility and the church. The Third Estate demanded a written constitution and declared the equal rights of man. They pronounced the abolition of privileges and the equality of all men before the tax gatherer. They demanded that the king should no longer exact from the country a sum of money fixed at his own pleasure, but that the deputies of the National Assembly should vote money and should keep a right of control over the expenditure of these monies.

The king had lost all his executive power and appealed to his troops, in part foreign mercenaries, to maintain his authority, and they surrounded Paris. In addition to this, he dismissed his liberal ministry. On July 14, 1789, the people of Paris destroyed the Bastille, the state prison, which event marked the beginning of the revolution. The laws became universal and equal, and the church lands were confiscated by the state. In September, 1792, Danton, the Minister of Justice, made no protest when about 1500 political prisoners were murdered in the prisons of Paris. During this same month the republic was declared, and in January, 1793, Louis XVI was guillotined. During the reign of terror, which ended in 1794, more than 2500 people were executed in Paris and more than 5000 drowned in the Loire at Nantes. Meanwhile France had disarmed three of her external foes and had enlarged her borders. In 1795 the convention to retain its power called for help from the young general, Napoleon Bonaparte. In 1797 Austria had been vanquished.

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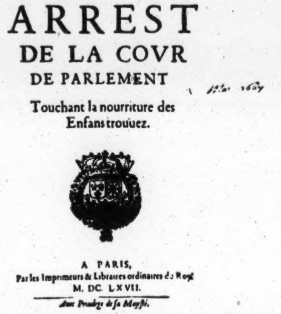
* From the Department of Paediatrics, University of Toronto, and the Hospital for Sick Children.



ARREST
DE LA COVR
DE PARLEMENT
3 Mai 1667
Touchant la nourriture des
Enfans trouuez.

A PARIS,
Par les Imprimeurs & Libraires ordinaires du Roy
M. DC. LXVII.
Auec Priuilege de ſa Majeſté.

FIG. 1. AN EARLY FRENCH LAW PROCLAMATION, MAY 3, 1667, IN QUARTO.

The condition of the poor, especially in the country, was on the whole immensely improved. Large estates had given place to very small ones. The amount of the harvest increased by 25 per cent, and the homes of the peasants were improved, being more spacious and cleaner. The laborers were less ignorant than their fathers. In 1799 Napoleon was First Consul, and in 1804 Emperor of France.

WET NURSING, THE PRINCIPAL METHOD OF FEEDING

During the eighteenth century the methods of infant feeding were maternal nursing, wet nursing, feeding with the milk of various animals, and the feeding of pap and panada.

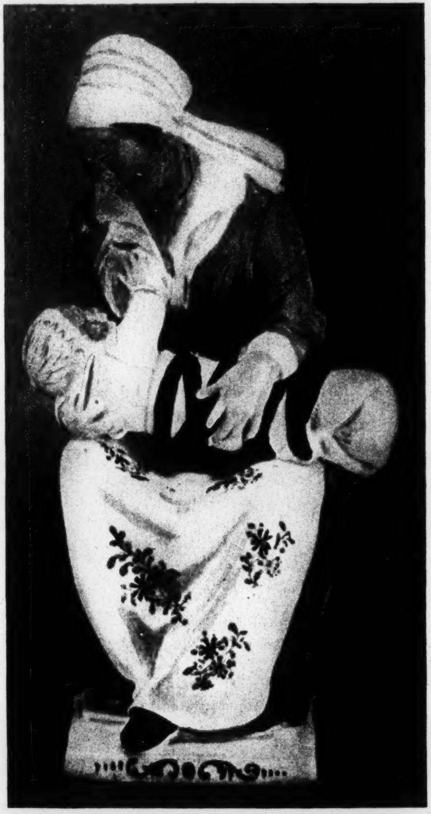


FIG. 2. "LA NOURRICE." A CHELSEA PORCELAIN GROUP, HEIGHT 6½ INCHES, *circa* 1755.

However, the majority of infants, especially those of the Parisians, were placed out with wet nurses, first since maternal nursing was not the custom, second to carefully guard the mother's beauty and freshness, and third on account of sexual incontinence. Even the poorest Parisians made a practice of abandoning their infants to the wet nurses. (Fig. 2.)

Dionis, in 1718, stated that: "Today not only ladies of the nobility, but yet the rich and the wives of the least of the artisans have lost the custom of nursing their infants." In 1777 the government distributed 100 boxes of medicines to the wet nurses in certain country districts, "where are found a considerable number of nurslings belonging to the most indigent portion of the people of Paris."

In 1780 it was estimated that about 21,000 infants were born each year in Paris. About 700 of these were nursed by the mothers; 700 by a nurse in the paternal home; 2000 or 3000, usually children of the rich bourgeois, were placed with wet nurses in the suburbs; and the remainder confided to wet nurses who came up from the provinces to obtain nurslings and then carried them back to their homes for feeding. (Fig. 3.)

Employment Bureaus for Wet Nurses. The bureaus through which contact was made between the infant's guardian and the wet nurse were under the control of the *recommandaresses.* As early as the twelfth century there existed in Paris employment bureaus for wet nurses and servants. These were hostelries where poor females in search of employment found food and cover. While wet nurses were cared for gratuitously at Saint Catharine's Hospital, the non-gratuitous establishments were directed by women known as recommandaresses.

By the parliamentary law of July 29, 1705, midwives, innkeepers and others were forbidden to lodge wet nurses in the city of Paris. Carriers were required to conduct the nurses to the Bureau de Recommandaresses where they were obliged to lodge. In the case of nurses coming to the city to nurse foundlings, the recommandaresses were required to conduct them to the Foundlings Hospital without charge. The punishment for contravention of this law was a fine of fifty livres (francs), collectable, as in all other laws concerning wet nurses, against the nurse's husband.

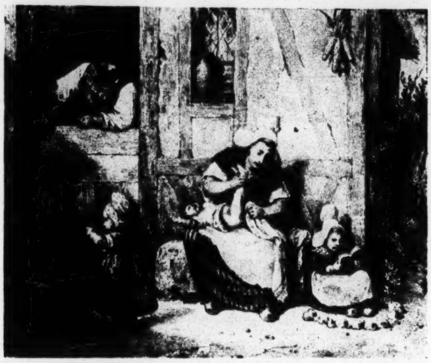


FIG. 3. "LA NOURRICE." NORMANDY, EARLY NINETEENTH CENTURY.

By the law of January 29, 1715, the importance of the profession of recommandaresses, "long established in our beautiful city of Paris," was recognized, and four bureaus in place of the previous two were formed. The nurse was required to register here her name, age, county, parish, profession of husband, age of her own infant and whether he was living or dead, her religion, married state, and whether she had or had not another nursling. These facts were to be certified by the curé of her home parish, and the register was open to police inspection. On returning home the nurse was required to present to her local curé a certificate from the recommandaresses containing the family particulars of the nursling.

The nurse was forbidden to return infants to their parents unless permission was obtained from them. If this was refused the Lieutenant Governor of Police signified into whose hands they were to be returned. To protect the infant from milk which was insufficient or of bad quality, the nurse was forbidden to have two nurslings at the same time, and was required to notify the parents if she became pregnant, at the latest in the second month. To protect the nurse, the fathers and mothers might be condemned for non-payment of fees due to nurses for nurslings placed through the recommandaresses.

During their stay in Paris the wet nurses found in the bureaus of recommandaresses neither care, propriety nor surveillance. Badly lodged and fed, they were exposed to all the dangers of the city to the great detriment of their morality and health.

In July, 1729, the profession of recommandaresses was regulated by the following statute:

> Since the effect of the laws depends upon the attention and the exactitude of the persons who are charged with their execution, we have turned our attention to the state and character of the recommendaresses, whose functions ought only to be confined to widows or married women, or to maidens of at least forty years of age, whose zeal, virtue and intelligence are such that they can appreciate and execute a large number of rules of which the least inobservance may lead to great abuses. For a long time these functions have been exercised by persons who have perpetuated them in their families by resignations pure and simple, or by title of inheritance, or yet by purchase from the heads of the police by whom these appointments have been made without the king's sanction, without assurance either of the capacity or morals of the incumbents.

The present four recommandaresses were, therefore, removed from their offices and future appointments were to be made by the Lieutenant General of Police.

> . . . from widows, married women, or maidens at least forty years old, whose zeal, virtue and capacity are known. After the primary establishment, future appointees are to be examined for their good life, morals, catholic religion and capacity for the position in the presence of two or three of the recommandaresses.

On August 22, 1761, the king placed his sanction upon the bureau of recommandaresses already established in Versailles, and laid down rules for its government. These were similar to those laid down for the bureaus of Paris, with the following new regulations:

> The recommandaresse will hold a second register in which to inscribe the names of nurses who wish to receive infants through her ministration, and when the nurse is so inscribed she will not be allowed to take nurslings other than through the recommandaresse's ministration.
>
> To obviate the abuse practiced by some nurses who place their nurslings to sleep in their own beds, several of whom have been found smothered or crippled, they are ordered to have in their homes a crib in which to lay the infant, and to have this certified to by their curé, who will so state in his certificate—only one child to be placed in a single crib.
>
> Nurses who come to Versailles to the houses of the rich at the sole requisition of the fathers and mothers, are required to take back with the infant a certificate of its family particulars, this certificate to be presented to their curé who will return a certificate to the Public Prosecutor of Versailles.
>
> To obviate the abuse of nurses taking weaned infants without passing through the bureau, or through unregistered meneurs and meneuses (the nurses' agents), which brings about great embarrassment and inconvenience in the order of families, since the curé in case of death does not know the infant's father and mother and cannot register the true names

of the infant, all weaned infants must be taken through the recommandaresses.

In executions for debt to nurses in case of effective and notorious impossibility to pay, the execution shall be delivered upon the domain rather than the domicile of the father and mother.

On December 17, 1762, new regulations were laid down in an Ordinance of Police:

> No nurse shall take a nursling unless her last infant has been weaned and is of the age of nine months, unless she has placed her own infant with another nurse; this to be certified by her curé. She must not take a nursling if her last accouchement is more than two years past.
>
> Recommandaresses must transcribe exactly on their registers the certificates of the infant's family affairs as on the certificate given to the nurse. As it has sometimes happened, either through the fault of parents or through the person whom they have charged with the procuring of a nurse, that errors of names have occurred, it is ordered that the extract of the certificate of baptism of the infant shall be presented to the recommandaresse.
>
> It is ordered that the nurses who come to Paris to obtain nurslings shall be visited by the Physician and Surgeon whom we have appointed, when the father or mother or other guardian of the nursling shall request it, or when the recommandaresse or the officer, whom we have charged with the inspection of nurses, shall judge it to be necessary. Equally at the request of the nurse or meneur the same physician and surgeon shall examine the nursling which is to be confined to them, and equally the father or mother or other person may request an examination of the infant when it is returned; these examinations to be without cost to the one requesting them.

The foregoing paragraph is the first mention of examination of nurse or infant by a physician.

Transport of Wet Nurses and Nurslings. From an early date the recommandaresses had the meneurs for auxiliaries. These brought in the nurses from the country. After having gathered together a certain number they crowded them into a cart and transported them to Paris. When the nurse had obtained a nursling the meneur returned them to their village in the same manner. The meneurs were allowed to receive older children from the parents and to transport them to the country where they were placed with the nurse. (Fig. 4.)

The conditions of transport were very detrimental to the infant, and in 1773 the police enjoined upon the meneurs that they should provide themselves with well-conditioned wagons, of which the bottoms should be of planks sufficiently covered with clean straw, the side racks exactly covered by well-assembled planks or by thatching and with a covered top. Since the meneurs had been carrying at times in these large wagons without attendance, crowds of infants returning to their parents, the transport of these infants was forbidden without accompanying nurses, seated on benches suspended in front and behind the vehicle, to care for the infants and to prevent the accidents to which they were liable to be exposed on the journey.

In the law of March 1, 1727, the calling of meneurs and meneuses was regulated. Payments for wet nurses could be made through the meneur, in which case the meneur collected an extra 5 per cent. Fees were to be paid monthly, and the meneur and nurse could not allow them to be more than three months in arrears.

To further protect the infant the meneurs were placed under the control of the recommandaresses, as were the nurses, in relation to lodging and registration at the bureau. They could obtain nurslings only through the recommandaresses. They were forbidden to abandon or expose infants entrusted to them for delivery to the wet nurse, or to transport a newborn infant without an accompanying nurse to feed it. If the nursling should die on the journey, report must be made to the nearest judge or priest who would give a certificate to be returned to the guardian. Nurses were obliged to bring or send back infants within fifteen days after being requested to do so by the infant's parent or guardian. In case of the infant's death its death certificate and linens were to be transmitted to the parent within fifteen days.

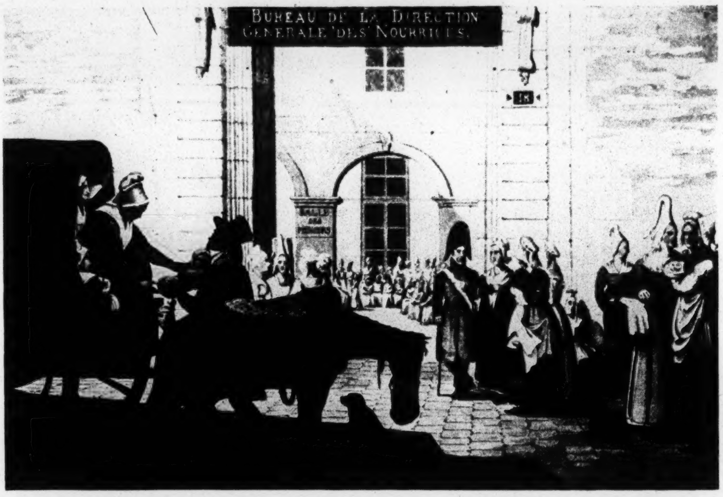


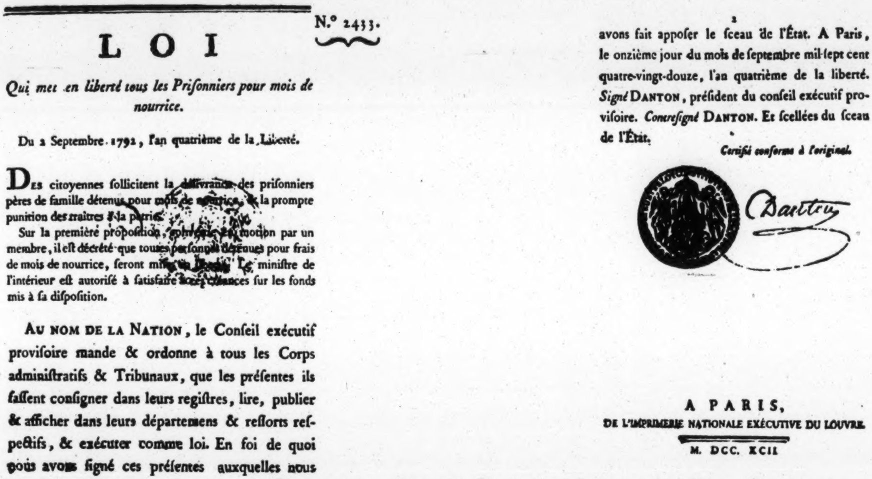
FIG. 4. "OFFICE OF NURSES." ON THE LEFT, A MENEUR WITH HIS CHARGES.

Payment of Wet Nurses. By a law of January 30, 1750, the pay of the wet nurse was placed at fifty sols per year. This was doubled to those not living in the child's home. In 1760 a nurse living in the outskirts of Paris was paid seven livres (francs) per month; in the provinces the minimum was five livres. In 1780 the average wage was eight livres per month.

Some difficulty had been encountered in the collection of fees due to wet nurses, and to remedy this the law of June 19, 1737, was passed:

> Since the declaration of July 29th, 1715, has given a new form to the establishment of recommandaresses, through whose intervention the infants of the inhabitants of Paris are placed in the hands of nurses in the country, and yet more since that of March 1st, 1727, which has added precautions to this subject, we see with satisfaction that an establishment, so necessary and so worthy of the attention of magistrates, carries a new degree of perfection, and is more capable than before of satisfying the object for which it was instituted.
>
> In the law of 1715 and repeated in that of 1727 it was stated that sentences which are adjudged for the payment of nourishing and nursing of infants which had been placed out with nurses, should be executed even by arrest if it is so ordered by the Lieutenant General of Police, unless there is an effective and known inability. Finally, with what

tempering of wisdom the law distinguishes between the unhappy case of an effective and known inability, and that of an odious and punishable resistance of fathers and mothers, and others who refuse to make satisfaction of the most indispensible duty of humanity. It is too frequent that these duties are evaded.



N.° 2433.

LOI

Qui met en liberté tous les Priſonniers pour mois de nourrice.

Du 2 Septembre 1792, l'an quatrième de la Liberté.

Des citoyennes ſollicitent la délivrance des priſonniers pères de famille détenus pour mois de nourrice, & la prompte punition des traîtres à la patrie.

Sur la première propoſition, convertie en motion par un membre, il eſt décrété que toutes perſonnes détenues pour frais de mois de nourrice, ſeront miſes en liberté. Le miniſtre de l'intérieur eſt autoriſé à ſatisfaire leurs créances ſur les fonds mis à ſa diſpoſition.

Au nom de la Nation, le Conſeil exécutif proviſoire mande & ordonne à tous les Corps adminiſtratifs & Tribunaux, que les préſentes ils faſſent conſigner dans leurs regiſtres, lire, publier & afficher dans leurs départemens & reſſorts reſpectifs, & exécuter comme loi. En foi de quoi nous avons ſigné ces préſentes auxquelles nous

2

avons fait appoſer le ſceau de l'État. A Paris, le onzième jour du mois de ſeptembre mil ſept cent quatre-vingt-douze, l'an quatrième de la liberté. *Signé* Danton, préſident du conſeil exécutif proviſoire. *Contreſigné* Danton. Et ſcellées du ſceau de l'État.

Certifié conforme à l'original.

Danton

A PARIS,
DE L'IMPRIMERIE NATIONALE EXÉCUTIVE DU LOUVRE.
M. DCC. XCII.

FIG. 5. LAW, BEARING AUTOGRAPH SIGNATURE OF DANTON, PLACING AT LIBERTY ALL THOSE IMPRISONED FOR FAILURE TO PAY WET NURSING FEES.

By a law of 1702, it is forbidden to arrest any person for civil debts without permission from a judge, but since not alone is the service an extreme one, but the sums are mediocre and the persons to whom they are due are indigent, it seems that one should remove all delay and remove all obstacles. Therefore, it is enacted that the past or future sentences of the Lieutenant General of Police, carrying arrest of fathers or mothers or others who have placed infants with nurses through the intervention of the recommandaresses, for the payment of nourishing these infants, should be executed by the capture of the condemned in the house, but not at an undue hour, nor Sundays or feast days, without further need of any special permission of the judge to this effect.

Each year in the city of Paris from 500 to 600 persons were imprisoned for failure to pay wet nurses' fees. Charitable associations were founded which were able to liberate some. On the grand feast days of the church and on occasions of public rejoicing, such as the marriages of princes, the municipality also delivered a certain number of these prisoners.

In 1789 the Bastille fell and Parliament began to pass laws to ameliorate the condition of the poor.

On December 11, 1791, the National Assembly passed a law relative to the relief to be given to the poor fathers of families imprisoned for non-payment of nurses' fees. A decree of urgence was passed that 225,788 livres (francs) be used by the directors of the Bureau of Nurses of Paris to acquit the debts of the poor fathers of families of the capital, who had been arrested previous to September the fifteenth for non-payment of wet nurses' fees. This charitable measure was later extended to other parts of France.

On August 25, 1792, it was decreed that no longer could one be imprisoned for non-payment of wet nursing fees, and in September of the same year, Danton, the Minister of Justice, while raising no hand to prevent the massacre of the political prisoners detained in the prisons of Paris, found time to sign the decree setting at liberty all prisoners detained for failure to pay fees due the nurses. (Fig. 5.)

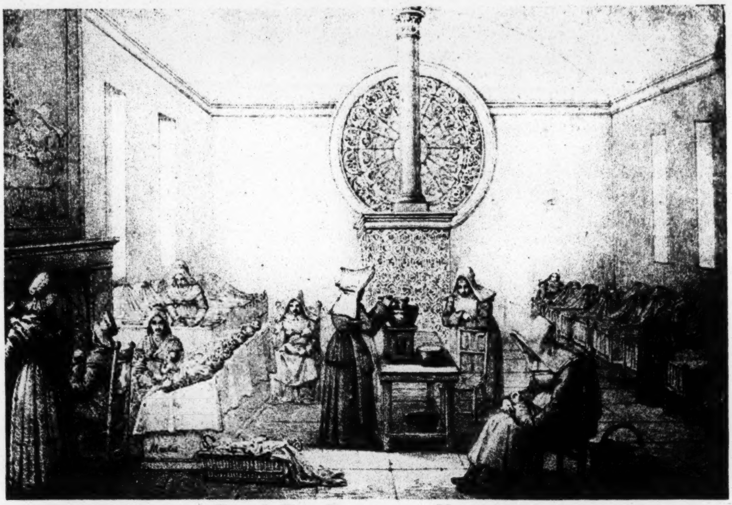


Fig. 6. The Foundlings Hospital.

Parents in the reign of terror still placed their infants with the wet nurses, since on January 20, 1793, a decree again authorized the Minister of the Interior to pay 67,102 livres to acquit an equal sum due to the Bureau of Nurses by 1664 fathers of families.

Enfans Trouvés

The Foundlings Hospital of Paris was founded in 1670, and shortly afterwards was united with the General Hospital.

Well administered, the Foundlings Home at Paris prospered and extended widely during the course of the eighteenth century. There were conducted the newborns who were abandoned by their mothers, not only from Paris, but also from the neighboring communities. The greatest mystery surrounded the receptions. Some infants were raised in the hospital, but the greater number were cared for by nurses who lived in the country. (Fig. 6.)

The admissions to the Foundlings Hospital of Paris gradually increased from its founding.

Number of Admissions to Foundlings Hospital of Paris

1670	312
1700	1,738
1750	4,187
1780	5,608
1800	3,900

In the whole of France the number of foundlings below twelve years of age was 40,000 in 1784 and 51,000 in 1798.

The mortality was exceedingly high. Of the admissions to the Paris Foundlings Hospital over 52 per cent died before the end of the first year, and over 74 per cent before the end of the fourth year. At the beginning of the nineteenth century the annual expense for the care of foundlings in France was about eleven million francs.

In the cities of France as in those of other countries, misery, improvidence, immorality and imposition upon the public charity were big factors in the abandonment of infants. No attempt was made to provide for the welfare of the illegitimate child by determination of paternity and assessment of charges for the infant's upbringing against him. Rather it was hoped to prevent the infant's death by providing readily accessible foundlings hospitals and making the deposition of the infant at these homes easy and entirely secret. The mother deposited her infant in the receptacle outside the hospital, pulled the bell and hurried away; the waiting attendant turned the revolving door and the infant became an inmate of the home. (Fig. 7.)

Letters Patent of the King, May, 1772, bringing about the dissolution of the Hôpital Enfans-Rouges, and the union of its rights and revenues to the Foundlings Hospital of Paris, read as follows:

> Our dear and good friends, the directors and administrators of the General Hospital of Paris, have made known to us that the number of abandoned infants who are presented daily to the Foundlings Hospital, whose administration is united with that of the General Hospital, has increased in the past years to such an extent that the fixed and casual revenues of the Foundlings Hospital are absolutely insufficient to sustain the charges. It is very natural and just to suppress the hospital called the Enfans-Rouges, and to unite its rights and revenues to those of the Foundlings Hospital.

The House of Enfans-Rouges was founded by Francis I in 1536 to raise the poor infants of whom the stranger mothers and fathers died at the Hôtel-Dieu. By the declaration of June 22, 1541, it received also the infants, orphans and poor of the suburbs of Paris and surrounding villages.

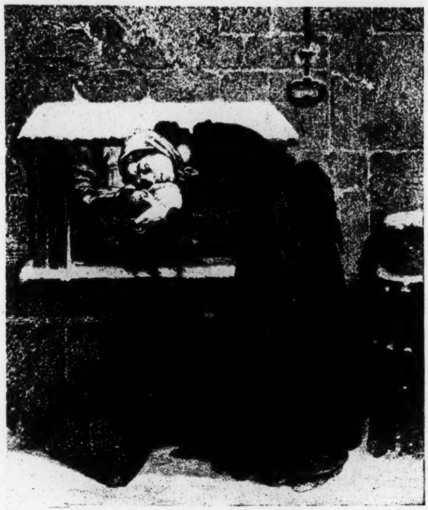


FIG. 7. "THE LAST KISS." THE DEPOSITION OF AN INFANT AT A FOUNDLING HOSPITAL.

The General Hospital, having been founded in 1656, and the Foundlings Hospital in 1670, Louis XIV considered that it would be more useful to the public not to have so many different establishments founded for the same objects, and ordered by his Letters Patent of March 23, 1680, that the administration of the Enfans-Rouges should be united to that of the Foundlings Hospital, permitting in consequence the directors to dispose of the funds and revenues, and the transfer of infants to the General Hospital:

> These orders for this suppression and union have been too long deferred. The deficit of the Enfans-Rouges has increased; therefore we order that this suppression and union should be carried

out. Its revenues and rights should be united to the Foundlings Hospital to be administered by the Directors of the General Hospital; that its infants actually in the Hôpital des Enfans-Rouges should be transferred to, and those of similar quality presented in the future should be received by the General Hospital, to be instructed, fed and brought up.

It is also ordered that the laws of 1541 and 1733, carrying permission to collect for the Enfans-Rouges in all the churches of Paris, should be executed for the profit of the Foundlings Hospital, and the women appointed by the directors are allowed to collect in all the churches of Paris without exception.

In the greater number of provinces there was no organized relief for foundlings. Each province had its custom and law; each provided for the needs of its foundlings according to its resources and the particular views of its law-givers, but all received express warnings against sending to the Foundlings Home in Paris the infants found in their territories.

An Ordinance of the Intendant of Flanders and Artois, forbidding all persons to charge themselves with the carrying of foundlings to the Foundlings Hospital in Paris or elsewhere outside the place of birth of these infants, was passed on January 5, 1773, for the following reasons:

We have been informed of the carrying for some years from the different provinces, and particularly Flanders and Artois, of a multitude of infants to the Foundlings Hospital in Paris, which by its foundation is established for the City of Paris only. For its upkeep there is imposed a tax upon the Seigneurs High Justices of that city. This hospital has neither funds nor space to receive infants from the whole of France. In addition, there is great danger to the infants during the long journeys made in all sorts of seasons.

This transference of infants from place to place was also forbidden by the Decree of the King's Council of State concerning foundlings, January 10, 1779.

His Majesty is informed that every year there come to the Foundlings Hospital in Paris more than 2,000 infants born in the provinces far distant from the capital. These infants, whom parental care ought to defend against the dangers of so tender an age, are entrusted without precautions, and in all seasons, to the public wagon drivers who are distracted by other interests and obliged to be a long time on the journey. As a result these piteous victims of the insensibilities of their parents suffer so much from the journey that nine-tenths perish before the age of three months.

It is forbidden to all drivers of vehicles, messengers and other persons to charge themselves with newborn infants or other abandonées, if they are not to be placed with a nurse or to be carried to the nearest hospital for foundlings. If the expenses cannot be met by the Provincial Hospital, grants will be made from the Royal Treasury.

His Majesty has remarked with pain that the number of exposed infants is increasing day by day, and that the majority are legitimate births; that these asylums instituted to prevent the crimes to which the fear of disgrace might induce an erring mother, have become by degrees depots favourable to the criminal indifference of parents. Through the admission of these infants a great strain is placed on the public funds, and the infants themselves suffer from lack of maternal care. He enjoins the clergy and charitable agencies to attempt to dissuade parents from carrying on with this practice.

The Revolution of 1789 changed completely the situation of foundlings and abandoned infants. The foundlings or *enfans trouvés* were those who, born of unknown fathers and mothers had been exposed in any place or brought to the hospitals destined to receive them, where they had been admitted without any attempt to determine their parentage. The abandoned infants were those who, born of known fathers and mothers and at first cared for by them, were forsaken without anyone knowing where the fathers and mothers had gone. The Revolution placed all under a uniform jurisdiction; it gave them a civil estate and regulated the manner in which their education should be directed.

The infants who had been abandoned were taken from the care of the High Justices by the law of July 10, 1790:

> The National Assembly, considering that the suppression of the rights of justice has brought about the extinction of the profits and fees which were attached to it, immediately relieves the ci-devant Seigneurs High Justices from the obligation of nourishing and caring for the exposed and abandoned infants in their territories, and they will be provided for temporarily in the same manner as the foundlings of whom the state has charge.

In the decree of the National Convention passed June 28, 1793, the second year of the Republic, concerning the organization of relief to be accorded annually to infants, aged persons and indigents, the following laws relating to infant welfare came into effect. As will be seen, these laws are almost the equal of those in force in advanced countries at the present time.

Relief for Infants Appertaining to Indigent Families

I. Fathers and mothers who have as their only resources the products of their labour, have a right to the nation's succour at all times that their earnings are not sufficient for the needs of their family.

III. He who lives from the products of his work and has already two infants in his charge shall be able to claim the nation's relief for the third infant which is born to him.

VI. The relief shall begin when the spouse reaches the sixth month of pregnancy.

XI. Infants which live only on the result of their father's work shall be a charge on the nation if the father dies or becomes so infirm that he is unable to work.

XII. In case of her husband's death the mother of a family who is not able to meet her needs by her work, has equal right to the nation's succour.

XIV. If those who receive this relief have no home and their parents. friends or strangers do not wish to receive them, profiting by the succour accorded to each of them, they will be received in the hospitals which are opened to them.

XVI. The relief shall not be greater than 80 livres for infants or 120 livres for mothers of families.

XVII. This pension shall begin for the infant at birth and terminate at twelve years. For the mother of a family who finds herself in the role of one needing relief, it shall begin on the day of her husband's death and continue as long as the need remains.

XVIII. Full pension is to be paid for the infant until six years of age, and two-thirds from the sixth to the twelfth years of the infant's life.

XIX. If the infant is suffering from infirmities, the relief may be carried on at the maximum level after certification to the infirmities by the Officer of Health.

XXI. The infant receiving relief from the Republic, having arrived at its twelfth year, if it shows a taste and aptitude for a mechanical profession, shall be placed as an apprentice at the expense of the nation for two years at an expense of not more than 100 livres per year.

XXIV. Those infants who wish to follow agriculture have equal rights to this second succour, which for them is fixed for all sections of the Republic at 200 livres payable at one time.

XXVI. Those who prefer to claim in the name of the infant which is to be born the relief which will be due to him, are required to submit that the infant will be nursed by the mother.

XXVII. The mother will not be allowed to dispense with filling this undertaking unless she produces a certificate from the Officer of Health that it is impossible or dangerous to nurse the infant, either for the mother or for the infant.

XXVIII. The mother will be allowed for the expenses of the accouchement 28 livres; an extra 12 livres will be paid for a layette to those mothers who themselves nurse their infants.

XXIX. Mothers unable to fulfill this undertaking must make known to a member of the agency in their community, where the infant has been placed, and give the name of the nurse to whom it has been confided.

Relief to be Accorded to Abandoned Infants

I. The nation charges itself with the physical and moral education of infants known under the name of "abandoned infants."

III. There shall be established in each district a house where the pregnant woman may retire for the accouchement. She shall be allowed to enter at whatever stage of pregnancy she wishes.

IV. Every woman who signifies her wish to nurse the infant to which she will give birth, and who has need of relief from the nation has the right to claim it. To obtain it, she shall not be held to other formalities than those prescribed for the mothers of families, namely, to make known to the municipality in which she resides her intentions and her needs.

VI. At any time when the infants are under the nation's charge, should it appear that they are in danger of death or that their health may suffer if they are left with the mother, the agency, after reference to the superior administrators, shall remove the child from the mother and place it according to its age either in the hospital or with another nurse.

VII. All expenses of accouchement and needs during the time of lying in shall be furnished by the nation. The most inviolable secrecy shall be preserved in all matters.

VIII. Notice of the infant's birth shall be given to the relief agency, which will immediately place it with a nurse.

IX. It shall, nevertheless, be permitted to all citizens other than those who are receiving relief from the nation, to present themselves at the agency to take one or several of the infants under the charge of the nation.

XI. If these persons ask for a pension it shall be accorded to them according to the infant's age.

XXV. All the infants obtaining relief from the nation, whether in hospital with their parents or with strangers, will be inoculated by the Officer of Health at the age and period which he believes most suitable.

XXVI. In each hospital a separate place absolutely apart from the buildings

> where the other infants are kept, shall be set aside in which to place those who are being vaccinated.

This decree of June, 1793, was amplified by the following further decrees:

Decree of the National Assembly, which fixes the indemnity accorded to families or individuals charged with abandoned infants, August 19, 1793:

> The price of a day's labour in the district will serve as the basis for these indemnities, which ought never to exceed eighty livres per year for each infant below ten years of age, and will be diminished by a third for the following years up to twelve years, when all payments will cease. These indemnities will be paid by the Minister of the Interior from the funds placed at his disposal for foundlings.

Law relative to foundlings, 27 Frimaire, the fifth year of the Republic (1796):

> The abandoned infants, newborn, will be received gratuitously in all the hospitals of the Republic. The National Treasury will furnish the expenses of those who are cared for in those hospitals which have not funds applied to this object. Infants must be carried to the nearest civil hospital.

30 Ventose an V (1796):

> The hospital is to be considered only as a depot from which the foundlings are to be placed permanently, unless ill, with nurses or other inhabitants in the country where they are to remain until twelve years of age. They are to be sent to the primary schools. The children are inspected by law officers every three months. In addition to the payment for nursing and care, the nurses are paid a bonus of six francs at the end of each three months up to nine months, and a bonus of fifty francs if the child arrives safely at the twelfth year. Payments for care will be determined locally, the price to be graded according to the services which the children are able to render at the different ages. After the twelfth year they will be placed with farmers, workmen or manufacturers. . . .
>
> The funds arising from portions of fines and confiscations attributed by preceding laws to hospitals and to the poor are to be exclusively employed in the payment for nursing of the foundlings and excess will be supplied through the Minister of the Interior.

These laws remained in force until remodelled by the Imperial Government in 1811, from which time no further change was made until after 1840.

[From Boyle: Opera Omnia, Venetiis, 1697.]

THE MILLENNIUM OF AR-RAZI (RHAZES)* (850–932 A. D.?)

By L. M. SADI, M.D.

DETROIT, MICH.

> Truth and certainty in medicine is an aim difficult to attain and the healing art as it is described in books is far inferior to the practical experience of a skillful and thoughtful physician. [Ar-Razi.]

THE exact date of Abu Bakr Muhammad ibn Zakariyya Ar-Razi's birth is not known, but it is believed to have occurred in the second half of the ninth century at Ray of Iraq Ajemi. The date of his death is generally accepted as 320 A.H. which corresponds to 932 A.D. Hence this year is his Millennium. In his early life he was a student of music, a physicist and an alchemist. Not until the age of forty did he undertake the study of medicine. His decision to do so was the result of his frequent visits to the hospital of Adudu'd-Dawla and his contact there with the aged dean of pharmacists whom he questioned ceaselessly about medical curiosities.

His tutor in the healing art was Ali-ibn-Rabban of Tabaristan whose book, "Firdaws al-Hikmat" (Paradise of Wisdom), a treatise on medicine and philosophy, was used as a text by Ar-Razi. Ar-Razi then applied himself to the study of medicine and philosophy, reading the works of Galen and Hippocrates and also acquainting himself with Hindu authors. His knowledge of physics and chemistry was a great asset to him. For a while he was made physician-in-chief to the hospital in his native city, Ray. In the Fihrist, Muhammad Ibn Hasan al-Warraq is quoted as saying:

> I once asked an old man of the town of Ray about Ar-Razi's clinic. He said that Ar-Razi was a serious old man with a large, drooping head who seated his pupils in rows according to their grades and attainments. It was Ar-Razi's custom to call first upon the lower class to examine a patient when he reported to the clinic. If this class failed to diagnose the patient's ailment he was handed over to the next higher class, and only after the malady had eluded the knowledge of all the disciples did it come to the master's attention.[1]

This system of clinical teaching was probably an innovation of Ar-Razi's and presents a striking similarity to the grading system used today in western medical teaching.

Having become renowned Ar-Razi was called by Adudu'd-Dawla to be the chief physician in the hospital at Bagdad, the final choice of fifty qualified applicants for the position.

When a site for the Bagdad Hospital was to be selected Ar-Razi determined it in an interesting way. He hung pieces of flesh in different sections of the city and in that district where the flesh showed the least amount of putrefaction, he located the hospital.*

Ar-Razi's work, which exceeds two hundred volumes, includes treatises on philosophy, chemistry, physics, astronomy, mathematics, theology, music and other subjects.

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* Usaybi'a doubts Ar-Razi's being a contemporary of Adudu'd-Dawla. Usaybi'a's "Uyun-al a'nba," Arabic edition by Imra-l-Quais-al-Tahhan. Cairo, Egypt, 1882, 1: 310.

* Read before the Journal Club of Detroit College of Medicine and Surgery, November 12, 1932.

As it is beyond the scope of this paper to give a full account of his authorships, only a few of his works, those that are of medico-historical interest, will be mentioned here.* These are as follows:

Kitabu'L-Hawi or (Continens)
Al Mansuri (Liber ad Almansorem)
Kitab al-Jadari Wal-hasba (De Variolis et Morbillis)
or (De Peste or De Pestilentia) (monograph on Smallpox and Measles)
Ja'mi (Compendium)
Kafi (Sufficient)
Madkhal (Introduction)
  A. Lesser
  B. Greater
Muluki (The Royal)
Taksimu-l'ilal (Division of diseases) (Divisiones)
Fakhir (Splendid)†
The medicine of the laity.
On venesection (De venoe-sections)
A treatise on eye diseases with medicine and treatment
An essay on the contraction and dilatation of the pupils in light and darkness.
Also individual books on:
Dietetics
Colic
Paralysis (hemiplegia)
Facial paralysis
The functions of the organs
Essay on rose fever‡
Coryza and bronchitis
Stones in the kidneys and bladder
Reduction of fractures
Hospitals (their requirements)
Hemorrhoids, fistula in ano
Burning occurring in the urethra and bladder (Gonorrhea?).

Among the chemical treatises, the "Arcandorum liber" is said by Sarton to contain a description of a list of twenty-five pieces of chemical apparatus. He further states that Ar-Razi attempted to classify chemical substances and carried on original investigations on specific gravity by means of the hydrostatic balance.[2]

"AL-HAWI" (CONTINENS)

The work that heads the list, "Al-Hawi" (Continens), excells all previous Arabic medical literature. It was not only Ar-Razi's most extensive work, but in it his originality in diagnosis and treatment of diseases struck a new note in contrast to the previous work of Arabic physicians which consisted mostly of translations from Greek authors. Its style, however, lacked clarity, and its method of classification was imperfect. It embodied his clinical notes which were evidently meant only for his own use. Absorbed in his clinic, he probably left the compilation of these notes and remarks to some of his students. The "Continens" is found only in parts today in several European libraries and is hardly accessible beyond the wall of these institutions. Authorities differ widely on the number of books which it contained. Some of the Latin writers claim that it consists of twenty-five volumes, some thirty and some, thirty-seven; on the other hand, the Arabian authors agree on twelve.* Ali Abbas, the magi, in his work ("Kamil-Al-Sinaat") describes the "Continens" as:

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* A complete list of his work is to be found in Ibn-Abi-Usaybi'a's "Uyun-al a'nba," Tarikhul-Hukma, and Fihrist. Also see *Isis*, 5: 26–50, 1923.

† Authorship is not certain. See Ibn-Abi-Usaybi'a's "Uyun-al a'nba," Arabic edition by Imra-I-Quais-al-Tahhan Cairo, Egypt, 1882, 1: 318.

‡ Ar-Razi observed that a certain Abu-Zaid-al-Balkhi was afflicted with it every spring season when the roses bloom. Usaybi'a's "Uyun-al a'nba," Arabic edition by Imra-I-Quais-al-tahhan Cairo, Egypt, 1882, 1: 319.

> . . . very comprehensive, in that it contains everything necessary for the student of medicine to know in remedying diseases and ailment. But it fails in treating temperaments, humor, anatomy and surgery. The material is unsystematically compiled. It lacks the classification necessary for scientific work, which is expected from so eminent an author. It seems to me, knowing the author as I do, that he intended one of two things: either that the work be a memorandum for his own use, fearing that something might happen to his other works and in that case that the "Continens" might then suffice for all; or he may have intended it to remain as a monument of his achievement with the expectation of resuming its revision and classification later on. Something must have hindered him, and death terminated his life too soon for the completion of the task.[3]

"Continens" was translated into Latin and published in 1486 A.D. and later was given many other Latin renditions. So far as we know no complete Arabic manuscript of it is extant, but six volumes of the work in Arabic are treasured in the British Museum and the Bodleian Library. To these, Edward Browne, Professor of Arabic at Cambridge University, had access, and from this material he translated the following case report which may serve as a sample of Ar-Razi's clinical notes:

> Abdu'llah ibn Sawada used to suffer from attacks of mixed fever, sometimes quotidian, sometimes tertian, sometimes quartan, and sometimes recurring once in six days. These attacks were preceded by a slight rigor, and micturition was very frequent. I gave it as my opinion that either these accesses of fever would turn into quartan, or that there was ulceration of the kidneys. Only a short while elapsed ere the patient passed pus in the urine. I thereupon informed him that these feverish attacks would not recur, and so it was.
>
> The only thing which prevented me at first from giving it as my definite opinion that the patient was suffering from ulceration of the kidneys was that he had previously suffered from tertian and other mixed types of fever, and this to some extent confirmed my suspicion that this mixed fever might be from inflammatory processes which would tend to become quartan when they waxed stronger.
>
> Moreover the patient did not complain to me that his loins felt like a weight depending from him when he stood up; and I neglected to ask him about this. The frequent micturition also should have strengthened my suspicion of ulceration of the kidneys, but I did not know that his father suffered from weakness of the bladder and was subject to this complaint, and it used likewise to come upon him when he was healthy, and it ought not to be the case henceforth, till the end of his life, if God will.
>
> So when he passed the pus I administered to him diuretics until the urine became free from pus, after which I treated him with terra sigillata, Boswellia thurifera, and dragon's blood, and his sickness departed from him, and he was quickly and completely cured in about two months. That the ulceration was slight was indicated to me by the fact that he did not complain to me at first of weight in the loins. After he passed pus, however, I enquired of him whether he had experienced this symptom and he replied in the affirmative. Had the ulceration been extensive, he would of his own accord have complained of this

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* The Fihrist in enumerating Ar-Razi's books and essays states that the "Continens," his major work, consists of twelve volumes. Fihrist, Arabic edition by Mustafa Muhammad, Cairo, Egypt, 1348 A. H., 1: 415.

symptom. And that the pus was evacuated quickly indicated a limited ulceration. The other physicians whom he consulted besides myself, however, did not understand the case at all, even after the patient had passed pus in his urine.[4]

In this case report and in others, Ar-Razi by emphasizing the case history, symptoms and signs of disease, by making a differential diagnosis between a fever due to malaria and one due to pyelitis, by shunning theoretical speculation so customary in that time, proves himself to be the greatest clinician of the Middle Ages.

"KITABU'L-MANSURI"

"Kitabu'l-Mansuri," which ranks in importance next to "Al-Hawi" (Continens) was dedicated to Al-Mansur Ibn Ishaq, the ruler of Khurasan. It is encyclopedic in its classification somewhat after the "Canon" of Avicenna. Evidently it was written prior to the Treatise on Smallpox and Measles. The Latinists agree that the book consists of ten volumes. Their subjects are as follows: Physiology and anatomy; Temperaments; Food and simple medicine; The means of preserving the health; Skin diseases and cosmetics; Diet of persons while journeying; Surgery; Poisons; The treatment of diseases of all parts of the body; Fevers.

In this work Ar-Razi has drawn considerably on the works of his predecessors, Hippocrates, Galen, Oribasius, Aetius, Paulus Aegineta; hence it can be looked upon as a reproduction of Greek medicine and is devoid of the originality manifest in "Al-Hawi." Ar-Razi's method of compilation, however, was instrumental in popularizing the book in the Latin West during the Middle Ages. Most popular was the ninth book which describes the treatment of diseases in general. Many well-known medical men of the Latin West have written commentaries on "Al-Mansuri," using it as a textbook for their students.

Now it behooves us to leave the Latinist and turn to the Arabian authors. The Fihrist[5] mentions "Al-Mansuri" before the "Continens" and notes that "Al-Mansuri" consists of ten volumes.

Ibn Khallikan[6] stated clearly that he had seen with his own eyes a copy of "Al-Mansuri" dedicated to Mansur Ibn Ishaq, the ruler of Khurasan. Usaybi'a agrees with ibn Khallikan on the whole that the Arabian authors speak cursorily of "Al-Mansuri" and are in agreement as to its contents.

The Arabic text of "Al-Mansuri" has never been published. It is found in parts in manuscripts only in the libraries of Dresden, Madrid and Oxford. It was given a Latin rendition by Gerardus Cremonensis and was published for the first time in Milano in 1481. Many editions appeared thereafter. The ninth book was especially favored. Several commentaries were written on it, and it was frequently used as a textbook in medical teaching.

"KITAB-AL JADARI WAL-HASBA" (TREATISE ON SMALLPOX AND MEASLES)

Ar-Razi's most original work, the Treatise on Smallpox and Measles, is conceded by most historians of medicine to be the first monograph written on the subject. However, Ar-Razi with the scientific honesty and the integrity of a true teacher gave Galen credit for mentioning smallpox in many of his works. Thus he says: "Any physician who claims that the good Galen did not mention smallpox and that he was unaware of it is undoubtedly mistaken. Such a person probably has either not read Galen's work at all, or if he has read it his reading was very careless."[7]

The belief of Dr. Cornelius Van Dyck, first professor of medicine in the American University of Beirut, is that the translator Hubaish-Ibn-Al-Hasan erred in translating Galen's work by mistaking the word which Galen used to denote acne for the one denoting smallpox.[8] Freind seems to be of the same opinion. He says:

> For perhaps from the time of Hippocrates to this very period, there never happened anything so remarkable in Physick, as the appearance of this new and surprising distemper. The original of which may be traced up from their own authors much further backward, than is commonly imagined, even up to the famous Epoch of Mahomet himself, in the beginning of the seventh century. The Measles, which was no doubt of the same age (called not improperly by Avicenna, Variola Cholerica) they look upon as a disease so near akin to the Smallpox, that they generally treat of them both together, as if the greater included the less. This was a distemper, without dispute, unknown to the Greeks, whatever some of the moderns have said to the contrary; and first observed in this nation and described by the Mohametans. And since it is one so extraordinary in its symptoms, so constant and regular in its stages, and so universally incident to all mankind, it were to be wished, that Mr. Le Clerc had thought fit to have given us a short extract at least of what these original writers have said of it: especially when in its very infancy we may find the image of this disease very well painted in their works, and the practice clearly enough delivered. That Tract of Rhazes alone entitled, a Discourse of the Pestilence, would very fully explain to us the idea they had of this distemper, and show us, that they were not at all unacquainted with the difference of the distinct and the confluent sort. By the earliest account we have of the Smallpox, we find that it first appeared in Aegypt in the time of Omar successor to Mahomet, though no doubt, since the Greeks knew nothing of it, the Arabians brought it from their own country.[9]

However, we know from the Koran[9] and the "Arab Chronicles"[10] that smallpox had appeared in Arabia as early as 569 A.D. The Chronicles record that it was brought from Africa by an Abyssinian army which, urged on by the Emperor Justinian, crossed Southern Arabia in 569 with the conquest of Mecca as its objective. In this plan it failed, however, for the army was infested by an epidemic of smallpox. The Koran describes the skin of the sufferer as resembling "leaves of plants eaten by worms,"[11] thus very vividly indicating pockmarks.

Dr. Van Dyck also believes that this epidemic was nothing but the eastward extension of the epidemic that had broken out in Egypt in 542 A.D.* In this he may be mistaken, for a critical examination of the account by Procopius leaves little doubt that the epidemic of 542 was not smallpox at all but more likely, according to the description of the signs and symptoms, an epidemic of bubonic plague. To quote from Procopius:

> It started from the Aegyptians who dwell in Pelusium.† Then it divided and moved in one direction towards Alexandria and the rest of Aegypt, and in the other direction it came to Palestine on

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* Dr. Van Dyck in his account gives the date as 544 A.D.

† Pelusium, an ancient city, the ruins of which are near the modern city of Damietta.

> the borders of Aegypt; and from there it spread over the whole world, always moving forward and travelling at times favourable to it. For it seemed to move by fixed arrangement, and to tarry for the specific time in each country, casting its blight slightly upon none, but spreading in either direction right out to the ends of the world, as if fearing lest some corner of the earth might escape it.

In describing the individuals afflicted with the disease his account continues as follows:

> They had a sudden fever, some when just roused from sleep, others while walking about, and others while otherwise engaged, without any regard to what they were doing. And the body showed no change from its previous colour, nor was it hot as might be expected when attacked by a fever, nor indeed did any inflammation set in, but the fever was of such a languid sort from its commencement and up till evening that neither to the sick themselves nor to the physicians who touched them would it afford any suspicion of danger. It was natural, therefore, that not one of those who had contracted the disease expected to die from it. But on the same day in some cases, in others on the following day, and in the rest not many days later, a bubonic swelling developed: and this took place not only in the particular part of the body which is called "boubon," that is, below the abdomen, but also inside the armpit, and in some cases also beside the ears, and at different points on the thighs. Up to this point, then everything went in about the same way with all who has taken the disease. But from then on a very marked difference developed: and I am unable to say whether the cause of this diversity of symptoms was to be found in the difference in bodies, or in the fact that it followed the wish of Him who brought the disease into the world. For there ensued with some a deep coma, with others a violent delirium, and in either case they suffered the characteristic symptoms of the disease. For those who were under the spell of the coma forgot all those who were familiar to them and seemed to be sleeping constantly. And if anyone cared for them, they would eat without waking, but some also were neglected, and these would die directly through lack of sustenance.[12]

If the disease so described was bubonic plague, it is apparent that the two epidemics were unrelated. And it follows that not until Ar-Razi wrote his monograph was there, so far as is known, a systematized epidemiological work on smallpox. To him, then should be given the credit for the first lucid and rational account of the disease.*

Ar-Razi's monograph is divided into fourteen chapters. The reason that prompted him to compile it is stated in the preface thus:

> It was at an evening in a home of a virtuous man who happened to be a prominent patron of the dissemination of useful science that smallpox was mentioned, I discoursed on the subject as far as my recollection permitted me that evening. My good friend, may Allah prolong his life, entreated me to compile an exhaustive and elaborate treatise on smallpox, for he failed to find anything written on the subject until that time—either modern or ancient. So I have written this treatise in the hope of gaining the favor and the reward of the Almighty.[13]

This preface is interesting because it throws a sidelight on Ar-Razi's social position and indicates in what great esteem learning was held by the gentry with whom he associated.

* Garrison says that Eusebius, Bishop of Caesarea, describes a Syrian epidemic of smallpox occurring in Syria in 302 A.D. See Garrison, F. H., History of Medicine. Ed. 4, Phila., 1929, p. 125.

In this treatise Ar-Razi attributed the etiology of smallpox to a ferment in the blood, like must in wine. He believes that this fermentation caused a change in the blood, as a result of which the eruption occurred. Probably for the first time in the history of medicine we find a suggestion of an approach to the fermentation theory of Pasteur. He assumed, however, that this ferment was innate* and was transmitted to the newly born from the placenta in the mother's womb. Epidemiologically he asserted that the disease was more prevalent during the spring and autumn and also more common during childhood. In describing the symptoms of smallpox he stressed the acute fever, severe pain in the back, terror in sleep, restlessness, dryness of skin, sense of heaviness and weight in the head, itching and burning all over the body and the eruption which follows. He distinguished between the discrete and the confluent type, making a differential diagnosis between measles and smallpox, the latter being usually accompanied by a cough and itching of the nose and ears.

The cases with good prognosis he designated as those with a freedom of respiration, clear mentality and a good pulse. The cases with bad prognosis he designated as those in which the respiration is fast, the patient is restless, the smallpox pustules are dense and confluent with ulceration. He also speaks of the occurrence of gangrene:

> When towards the end of the disease the patient is taken by a very severe pain in the leg or hand or other extremities and pustules turn green or black in color and the patient grows weaker and the pain becomes intense, or the limb is deeply colored, then death is inevitable. But if the patient grows stronger he will recover but the limb will mortify.[14]

In his treatment of the disease he emphasizes the importance of cold fluid administration, fresh air, fruit juices of acid and astringent plants like pomegranate. "Let their food be such as to cool the fever like soup of lentils, broth mixed with the juice of unripe grapes, acid minced meat etc. Let them drink water cooled with snow or pure spring water."[15] He resorted to blood-letting in strong and vigorous individuals, he also regulated the patient's bowels, avoiding the use of strong cathartics. He recommended barley water and decoctions of figs, raisins and similar mild agents, reserving the use of opiates for the extreme restlessness, sleeplessness and looseness of bowels. In very high fevers he recommended cold water sponging unless contraindicated by the status of the pulse and respiration. To prevent eye infection in smallpox he recommended collyriums; for throat infections, gargles; and ointments for the scab of the pustules. It is very unfortunate to see that this rational method of treatment was not usually followed in the sixteenth and seventeenth centuries, and it is not until the latter part of the eighteenth century that medical authorities in Europe saw the advantage of following Ar-Razi's therapeutic measures. Even the great Sydenham in his early writings advocated drastic methods of bringing out the pustules by application of heat. Freind says:

> Even our countryman Sydenham carried this notion to an extremity in the first edition of his works: though afterwards he was so wise as to retract a great

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* Theory of "Innate Contagion"; that is why he feels that the disease is so universal.

> deal of what he had said, and came into the moderate method, as without dispute more agreeable to reason, and to the temper of our Island.[16]

In other words he used methods similar to those of Ar-Razi; and it may be said that except for the introduction of preventative cowpox inoculation by Edward Jenner in 1798, there has been little added to the description and treatment of the disease in the last thousand years.

It is interesting to note that in the last part of the first chapter of his monograph, Razi in explaining why smallpox is so infrequently found in old age makes the following statement:

> And as for old men, the Small-Pox seldom happens to them, except in pestilential, putrid, and malignant constitutions of the air, in which this disease is chiefly prevalent. For the putrid air, which has an undue proportion of heat and moisture, and also an inflamed air, promotes the eruption of this disease, by converting the spirit in the two ventricles of the heart to its own temperament, and then by means of the heart converting the whole of the blood in the arteries into a state of corruption like itself.[17]

This sentence would seem to prove beyond doubt (a) that Ar-Razi was fully aware of the presence of blood in the ventricles of the heart and arteries; (b) that he realized the spread of the "corruption" from the heart blood to the arterial blood; and (c) that the corrupted blood was conveyed by means of the heart to the arteries. No mention is made of the heart action or circulation of the blood in a direct fashion, but it is most certainly to be inferred from what he has written that Ar-Razi understood there was a circulation of the blood. It seems strange that the rôle played by the heart and arteries in spreading infectious diseases to all parts of the body so clearly defined by Ar-Razi should have received so little attention in western medical literature, especially when his monograph on Smallpox and Measles has appeared in various languages about thirty-five times over a period of approximately four hundred years.

AR-RAZI'S PERSONALITY

There will be little doubt from the foregoing that Ar-Razi was a most versatile scholar of an indefatigable industry. His keen sense of observation and ability to learn from nature distinguished him from others of his country whose main source of medical knowledge was Hellenic. His clinical insight was brightened by his knowledge of humanity. In one of his writings entitled "Upon the circumstances which turn the heart of the Most Men from Reputable Physician" he says:

> Amongst those factors which make the people turn away from the intelligent physician and place their trust in impostors is the delusion that the physician knows everything and requires to ask no questions. If he inspects the urine or feels the pulse, he is supposed to know what the patient has eaten and what he has been doing. This is lying and deception and is only brought about by trickery, by artful questions and speech, through which the senses of the public are deceived. Many hire men and women to find out all the circumstances of the patient and to report what is told them by servants, friends and neighbors. I myself, when I began to practice medicine, had resolved to ask no questions when the urine had been given me, and had been much honoured. Later, when it was seen that I made circumstantial inquiries, my reputation sank.

Another circumstance which brings physicians into contempt is that many diseases are too little removed from the borderline of health and are thus difficult to recognize and cure; others, malignant in themselves, externally appear trivial. When the layman sees that the physician is in doubt concerning his cure he draws it as a certain inference that the physician will understand still less of severer and more extensive illnesses. This is a false analogy. The symptoms of such diseases are less obvious because they are slighter deviations from the normal, and their cure is more difficult because no drastic remedies can be applied, but only those the effect of which is gradually brought about, such as diet, etc. An official of the hospital once complained of difficulty in moving some of his finger joints on account of a small but very hard sore which had for some time resisted the remedies he had applied. He openly reviled the physicians, saying: "If your art does not suffice to cure a small sore on the finger, how can you treat broken ribs and arms?" He then sought treatment from women and from the vulgar.[18]

Ar-Razi's personality portrays a broad human sympathy. Many of his sayings disclose in what esteem he held his profession. The following brings us nearer to this side of his personality than any we encountered among his contemporaries: "The physician should desire the cure of the patient more than his fee, he should also prefer the treatment of the poor to that of the rich, he should be thorough in his instructions and prodigal in benefiting the public." He also wisely realized that our knowledge of the art and science of medicine is indeed far from complete, showing how humble the true student of medicine should be.

Freind, from his "Al-Mansuri," quotes the following account of impostors:

There are so many little arts used by Mountebanks and Pretenders to Physick, that an entire treatise, had I a mind to write one, would not contain them: but their impudence, and daring boldness is equal to the guilt and inward conviction they have of tormenting and putting persons to pain in their last Hours, for no reason at all. Now some of them profess to cure the Falling-Sickness, and thereupon make an issue in the hinder part of the head, in form of a cross, and pretend to take something out of the opening, which they held all the while in their hands. Others give out, that they can draw snakes or lizards out of their patients noses, which they seem to perform by putting up a pointed iron probe, with which they wound the nostrils, 'till the blood comes: then they draw out the little artificial animals composed of liver, etc. Some are confident, they can take out the white specks in the eye. Before they apply the instrument to that part, they put a piece of fine rag into the eye, and taking it out with the instrument, pretend it is drawn immediately from the eye. Some again undertake to suck water out of the ear, which they fill with a tube from their mouth, and hold the other end to the ear; and so spurting the water out of their mouths, pretend it came from the ear. Others pretend to get out worms, which grow in the ear, or roots of the teeth. Others can extract frogs from the under-part of the tongue; and by lancing make an incision, into which they clap in the frog, and so take it out. What shall I say of bones inserted into wounds and ulcers, which, after remaining there for some time, they take out again? Some when they have taken out a stone from the bladder, persuade their patients, that still there's another left; they do this for this reason, to have it believed, that they have taken out another. Sometimes they probe the bladder, being altogether ignorant and uncertain, whether there be a stone or no. But if they don't find it, they pretend at least to take out one they have in readiness before, and show that to them. Sometimes they make an incision in the anus for the piles, and by repeating the operation often bring it to a fistula, or an ulcer, when there was neither before. Some say they take phlegm, of a substance like unto glass, out of the penis or other part of the body, by the conveyance of a pipe, which they hold with water in their mouths. Some pretend, that they can contract and collect all the floating humors of the body to one place, by rubbing it with winter-cherries; which causes a burning or inflammation, and then they expect to be rewarded, as if they cured the distemper; and after they have suppled the place with oil, the pain presently goes off. Some make their patients believe they have swallowed glass; so, taking a feather, which they force down the throat, they throw them into a vomiting, which brings up the fluff they themselves had put in with that very feather. Many things of that nature do they get out, which these impostors with great dexterity have put in; tending many times to the endangering the health of their patients, and often ending in the death of them. Such counterfeits could not pass with discerning men, but that they did not dream of any fallacies, and made no doubt of the skill of those whom they employed: till at last when they suspect, or rather look more narrowly into their operations, the cheat is discovered. Therefore no wise men ought to trust their lives in their hands, nor take any more of their medicines, which have proved so fatal to many.[19]

This vivid account of the quacks and charlatans of his age must have had a depressing influence on the very productive, tireless and devoted teacher of medicine of the tenth century. It is reported that in his old age he was totally blind because of the cataract. When a surgeon advised an operation for the recovery of his sight, "No," the master answered, "for I have seen so much of the world that I am weary of it." And although he enjoyed an enviable practice and was the head of the largest hospital in Bagdad, he died in blindness and poverty.

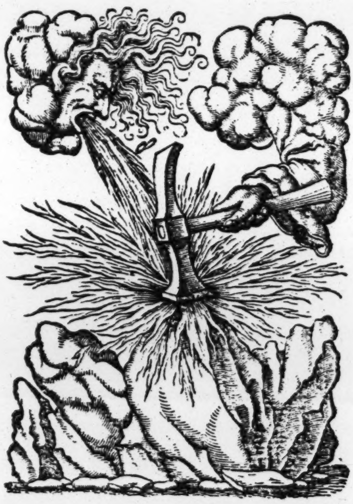
REFERENCES

1. FIHRIST. Arabic Edition by Mustafa Muhammad. Cairo, Egypt, 1348 A.H. p. 415.
2. SARTON, G. Introduction to the History of Science. Balt., 1927, 1: 609.
3. ALI-ABBAS. Kamil-Al-Sinaat. Arabic Bulaq edition, Cairo, Egypt, 1294 A.H. (corresponding to 1877 A.D.), 1: 5.
4. BROWNE, E. Arabian Medicine. London, 1921, p. 52.
5. FIHRIST. Arabic edition by Mustafa Muhammad. Cairo, Egypt, 1348 A.H., 1: 417.
6. The Latinist and the Modern Orientalists seem to be in doubt as to the identity of Mansur, to whom the book was dedicated, although Ibn Khallikan seemed to know that he was the ruler of Khurasan. Ibn Khallikan's "Wafayat Al A'yan" (Death of the prominent men). Arabic Bulaq edition, Cairo, Egypt, 1299 A.H. (1881 A.D.), 2: 103–107.
7. Translated from Ar-Razi's Treatise on the Smallpox and Measles. Arabic edition of the Syrian Protestant College, Beirut, Syria, 1872, p. 9.
8. Translated from Ar-Razi's Treatise on Smallpox and Measles. Arabic edition of the Syrian Protestant College, Beirut, Syria, 1872. See footnotes by Dr. C. Van Dyck, p. 9, also author's appendix, p. 75.
9. FREIND, J. The History of Physick. London, 1726, Pt. 2, p. 188.
10. SHEIKH MUHAMMAD AL-KOUDARY. The History of Islamic Nations. Arabic edition by Mustafa Muhammad, Cairo, Egypt, 1922, 1: 41. Abrah's army while attacking Mecca employed on this expedition a number of elephants and this year was afterward known in Arab Chronicles as the Year of Elephants (569 A.D.). This year is not only famous because of the Siege of Mecca

but for the birth of the prophet Muhammad.

11. The Holy Koran, Chap. cv, Soura entitled the "Elephants Revealed at Mecca." Dr. Lucien LeClerc, unfortunately, not thoroughly familiar with Koranic Arabic, takes the word "Ababil" to denote a certain bird of heaven, while really the word "Ababil" means flocks of birds with no particular specification. See LeClerc, L. Histoire de la Médecine Arabe. Paris, 1876, 1: 20–21.
12. PROCOPIUS. History of the Wars. Books 1 and 2, Greek text with English trans. by Dewing, H. B., London, 1914, 1: 453–457.
13. Translated from Ar-Razi's Treatise on Smallpox and Measles. Arabic edition of the Syrian Protestant College, Beirut, Syria, 1872, p. 6.
14. Translated from Ar-Razi's Treatise on Smallpox and Measles. Arabic edition of the Syrian Protestant College, Beirut, Syria, 1872, p. 74.
15. *Ibid.*, p. 61.
16. FREIND, J. The History of Physick. London, 1726, Pt. 2, p. 202.
17. GREENHILL, W. A. Translation of Ar-Razi's Treatise on Smallpox and Measles for the Sydenham Society, London, 1848, p. 30.

    Because the introduction of Ar-Razi's conception of the circulation of the blood may be opposed, the writer, whose native language is Arabic, has chosen in this instance to retain the excellent translation by William Alexander Greenhill.
18. Ernest Playfair's English translation of Max Neuburger's History of Medicine, London, 1910, 1: 363.
19. FREIND, J. The History of Physick. London, 1726, Pt. 2, p. 65.



A TREATISE ON THE BEZOAR STONE

BY THE LATE MAHMUD BIN MASUD THE IMAD-UL-DIN THE PHYSICIAN OF ISPAHAN

Translated from the Original Persian

By CYRIL ELGOOD, M.D.

FLORENCE, ITALY

Of the many gifts of Persian science to European medicine the history of few is more interesting than that of the bezoar stone. The very name in the English language is a corruption of the Persian word Padzahr, showing that it is to the Persians that Europe was indebted for the knowledge of this wonderful antidote.

It is strange that on a subject of such value as an universal antidote there is so little literature. Adams in his appendix on "Substances introduced into Materia Medica by the Arabians" complains that he can find no "Arabian work" (by which presumably he means Persian or Arabic) on the subject, excepting the book of Ibn Ul-Baytar, and "his account is very indistinct and unsatisfactory."[1] Although the great majority of the medical writers of the Persian School of Medicine briefly describe the action of the stone and several give a description of the various kinds that are employed, yet this complaint is just. I, therefore, present the following treatise which I believe to be the earliest work entirely devoted to the subject. Though adding but little to what is scattered through earlier writers on the subject, it is to be looked upon as a concise and authentic statement of the views of the Persian School upon the bezoar stone.

Of such value was the bezoar stone that early in its pharmacological history spurious stones were manufacfactured. It is, therefore, necessary at the outset to classify stones into true and artificial. The true stone was a natural calculus, though Persian writers are at times prepared to admit as genuine the vegetable and mineral bezoar stones, which it would be more just to classify as artificial. The genuine stone appears to have been a calculus found in the belly of a wild goat that inhabited the northeast corner of Persia. The belly must be understood to include both stomach and gall bladder—Persian writers themselves are undecided which organ was the true source, but definitely exclude the urinary bladder. The artificial stones were an artefact of wax and herbs.

This stone, whether taken internally or used externally, was held to be an antidote against the bites of snakes, all venomous insects, and the majority of vegetable and mineral poisons. Its curative effect was later extended to include plague, epilepsy, smallpox, and certain fevers, for all of which it was held to be a specific. So universal was its application that by the seventeenth century Persian writers use the word "padzahr" to mean "antidote" in general, and use the Arabic term "hajar-ul-tis," that is, goat stone, or some qualification, if they refer to the bezoar stone alone.

The history of the stone is long and glorious. The author of the treatise here presented asserts that the Greeks had knowledge of it. But I can find no confirmation of this. That it was used in the East before the preaching of Islam would seem sure. It is stated that it was known to the Hebrews of ancient times, who termed it Bel Zaard, which means "the master."[2]

But the impetus to its general use was supplied by the physicians of the Arab School of medicine. Mahomed ibn Zakariyya Al-Razi (Rhazes) (850–932 A.D.) mentions the stone both in his "Continens" and in his "Al-Mansuri." An old English translation of this latter passage runs:

> The evill Venoms that doe offende the heart and woorke their effects, O how little profite doeth any cure prove in them, if the Bezoar be not taken, for that doeth resist it. Moreover I myself saw that it did resist the venome called Napelo which is the venome that doeth penetrate more than al venoms.[3]

Ali ibn Ul-Abbas (Haly Abbas), who flourished in the second half of the tenth century, speaks about the stone in his Kitab-ul-Maliki (or Liber Regius), and Abu Ali ibn Sina (Avicenna) (980–1037 A.D.) in his "Canon of Medicine" makes several passing references to its efficacy.

The first reference to the stone in European scientific literature would appear to be in a work of Avenzoar, an Arab physician of Seville, about the year 1140 A.D. Later, Nicholas Monardes devoted a long account to the virtues of the stone and recounts that one of the Edwards was cured by the use of the stone,

> And a King of England called Edward, was delivered by means thereof from a poisoned mortall wound that the great Soldane with a venomed glaive gave him in a battaile that they fought beyonde the seas neare to the Citie of Aaron. When hee was almost dead, there was given to him the Bezaar Stone by one who was the greate maister of the Templers, which was an order in those daies of great estimation, and verie riche.[4]

In England the stone was so highly prized that Queen Elizabeth carried one set in a ring upon her finger; and it figured in the London pharmacopeias from 1618 to 1746. As late as 1808 Fateh Ali Shah sent some prized specimens to the Emperor Napoleon I, as a friendly offering of one of his most valued possessions. But the Emperor threw them with scorn into the fire.

To return to Persia once more. The court of Shah Abbas and his successors, so prolific in pharmacological treatises, produced many handbooks dedicated to an exposition of the action and usage of the bezoar stone. The earliest that I have discovered are the "Alfaz-ul-Advia" (or Vocabulary of Drugs) by Nur-ul-Din Mahomed, the "Ain-ul-Mulk," of Shiraz, written in 1628,[5] the "Risala-i-Padzahr" (or Handbook of Bezoars) of Mirza Qazi bin Kashaf-ul-Din Hamawi of Yezd, written about 1650,[6] and the "Tuhfah-i-Sulimani" (or Gift of Solomon) of Mahomed Kazim Teherani written in 1668.[7] But prior to all these, and presumably the prototype upon which they were modelled, is the treatise which is here presented, which was composed by Hakim Imad-ul-Din Mahmud ibn Masud bin Mahmud. The treatise is undated, but must have been composed during the latter half of the sixteenth century, at least fifty years prior to the "Alfaz-ul-Advia." Even as Imad-ul-Din was the first to devote a monograph to the newly appeared disease of *Atishak* or syphilis* so he would appear to have been the first to have made a serious study of this reputed antidote. Further reading in the libraries of Europe (places far better for the study of Persian than Persia itself) allow me to add to the brief notes that I there made about the author and his works, when I presented his monograph on Atishak. I wish to modify some of the statements I there made.

In the first place it is possible to date his writings more accurately. He was apparently a contemporary with one Nur Ullah Ala-ul-Din. For Nur Ullah in his work on "The China Root" quotes with approval Imad-ul-Din. On the other hand, Imad-ul-Din in his own work on the China root quotes verbatim the first eighty lines from Nur Ullah's work on the subject. Now, Nur Ullah states in his pamphlet that he first became interested in the question of China root in the year 1540 A.D. Again, Kashaf-ul-Din Hamawi states in his work on the bezoar stone that he made his studies under Imad-ul-Din and we know that Hamawi died in 1664. If, then, Hamawi died in his eightieth year (a later is not likely) and began to study medicine in his tenth (an earlier is not probable) and Imad-ul-Din died very soon after this, the earliest date for his death would appear to be about 1600 A.D. And in view of Nur Ullah's statements we must date his birth about 1520. For the moment a more accurate statement is impossible.

In the second place, I now know that the Tahfat-ul-Sadiyeh, which I quoted as one of his works, is not from his pen at all, but is to be ascribed to the pen of another Mahmud bin Masud, who bore the title of Qutab-ul-Din and who flourished 300 years earlier. The similarity of the names and the fact that both had an uncle of the name of Kamal-ul-Din, the Physician, led me into this error. Further reading of the manuscript has shown me that the writer speaks there of Qalaun as the reigning Sultan of Egypt, and Qalaun reigned from 1279 to 1290 A.D. And in the second place, there is other evidence to show that a Mahmud bin Masud, a physician, accompanied by an uncle, also a physician, did go to Egypt about 1280 on an embassy from the Shah of Persia. The story of Imad-ul-Dins wanderings to Baghdad, Constantinople, and Egypt in search of medical lore, as well as his ophthalmic appointment in Shiraz, being derived from the Tahfat-ul-Sadiyeh, must, I regret, be ascribed to his earlier namesake.*

On the same page I stated that at Meshed Imad-ul-Din became "personal physician to Prince Ali ibn Musa ul-Reza, the Governor." My learned Persian friend Doctor Saeed Kurdistani has pointed out to me that this is not the name of a governor of Meshed, but the name of the Saint who is buried there and that the Persian phrase should properly be interpreted "physician attached to the shrine of Our Lord Ali ibn Musa Al-Reza." He refers to the Saint again on page 467 of the translation. The word that I translate as "friendship" should there be rendered as "service."

Finally, in the light of these corrections the list of works from the pen of Imad-ul-Din that have survived, should be:

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* Translated in extenso in ANN. MED. HIST. 3: No. 5, pp. 465 et seq.

* Cf. The ANNALS, 3: No. 5, p. 466.

1. Al-Markibat-ul-Shahiyeh (Royal Prescriptions). His only surviving work that is written in Arabic.
2. Risala-i-Yanbu fi Ilm-il-Tibb (Rivulets in the Healing Art).
3. A Treatise on the Beneficial and Injurious Properties of Opium.
4. A Treatise on the China Root.
5. A Treatise on the Bezoar Stone, the subject of the present paper.
6. Risala-i-Mujarrabat (The Handbook of Experience).
7. Nuskha-i-Badal-i-Afyun (Prescriptions of Substitutes for Opium).
8. Dar Biyan-i-Baz Tarakib (A Second Volume of Prescriptions).
9. A Fragment on Pharmacy.
10. A Treatise on Anatomy. And
11. Risala-i-Atishak (A Treatise on Syphilis).

With regard to the manuscripts of this work I only know of two. One is in the British Museum, London, and is numbered A.D. 19619 Foll. 310 et seq. It is dated A.H. 1103 (= A.D. 1692). The other is in my private possession and is undated. From the style I am inclined to assign it to the same period as the Museum copy. Both texts are hopelessly corrupt. Thus, the Museum Ms. contains the sentence "The bigger Stone is a water-lily (nilufar)," which is nonsense until compared with my text which runs "The bigger the Stone the better (nikutar)." Again, my Ms. has "hairs resembling alum (shab-i-Yamani)," whilst the Museum copy reads "hairs resembling the back of a fish (pusht-i-mahi)," which at least is better sense.

Again, several passages are given at greater length in the Museum copy than they are in mine, and vice versa. Generally speaking, I have used in every case the fuller version. I have not hesitated to transpose a few passages and to link together the text of kindred subjects, which are separated in the original by what I imagine to be a later writer's interpolation.

I am, however, inclined to think that the passage on page 78 beginning "For it is to be found in Hindustan" as far as "obtained from mountain goats" is an interpolation by some Indian scribe. In the first place, the whole passage is missing in my Ms. In the second place, it describes the weight of the stone in tolas, an Indian, not a Persian weight, a system of weights and measures that the author Imad-ul-Din uses nowhere else. And thirdly, the value of the stone is quoted in a coinage unknown to the Persians, so that the writer feels himself obliged to translate the word. The finding of a contemporary Ms. is highly desirable for a knowledge of exactly what Imad-ul-Din did write.

It is not without interest to note that the bezoar stone is still in use in Persia today, though it is valued among the educated more as a curiosity than as a drug. A fair-sized stone was once presented to me by a grateful patient; but the cupidity of my dispensary servant overcame his respect for his master's goods, and the stone, together with a quantity of saffron in which it was carefully preserved, disappeared during one of my absences from Teheran.

REFERENCES

1. ADAMS. The Seven Books of Paulus Aegineta. London, 1847, pp. 426 and 427.
2. THOMPSON. Poisons and Poisoners. London, 1931, p. 52.
3. Joyfull Newes of Nicholas Monardes done into English by John Frampton, 1577, p. 76.
4. Joyfull Newes. p. 83.

5. The Vocabulary of Drugs. Text and English translation by Francis Gladwin. Calcutta, 1793.
6. The Ms. is in the State Library at Leipzig, No. 267. foll. 68–78.
7. The Ms. is in the India Office, London, No. 2336 foll. 184–282.

A TREATISE ON THE BEZOAR STONE BY THE LATE DOCTOR IMAD-UL-DIN (AND MAY GOD HAVE MERCY UPON HIS SOUL)—

In the Treatment of Hippocrates it is related that a certain substance is brought from Fars to which has been given the name of Hajarul-Tis or Goat Stone.[1] It is a product of the hills and desert. It has a milky appearance and is neither rough nor smooth. When split open, it is found to be a series of skins or layers, like an onion. Within the innermost skin instead of a kernel, is a piece of green grass around which the skins and layers have been wrapped, as it were. This is known as a Grass Bezoar Stone.

ACTION OF THE STONE

If the Stone is ground up with an infusion of fennel and applied to the sites of poisonous bites, at once the pain is relieved and the poison is extracted. I myself once saw a man who had been bitten by a hornet. The site of the sting swelled up and became very red. A little of this Bezoar Stone was ground up with water and applied to the sting. At once, wherever the effects of the ointment reached, the natural colour was restored and the swelling subsided. There is, too, the story of some generals, who were summoned to a conference during the war and there saw a man who had been bitten by a snake. Since it was a time of war and they had at hand none of the Great Theriacum, they dissolved in pure wine about six barley grains' weight of the Bezoar and gave it to the man, who had been bitten, to drink. They also gave him a little milk. His body then came out in a pustular rash; but, when he reached his home, he was completely cured.

Other people say that the Bezoar is a kind of stone, similar to one that is made from wax, lime, and clay; for it obviously consists of three parts. When it is ground up in a mortar with saffron, it turns red, like drops of blood. If it is rubbed over the site of insect bites—and I include vipers, snakes, and scorpions—at once the pain is relieved. Kings value this stone immensely. This kind of stone, too, is called a Bezoar Stone. I myself have seen monarchs who have prepared a draught of the Stone and who have set it in the midst of precious jewels. Whenever anyone was stung by a hornet, they poured a little of the draught into some milk and after a little while gave it to the man, who had been stung, to drink. At the same time they rubbed the place of the bite with the Stone. After this the milk was vomited up and the body of the patient scarified. And at once he was relieved.

THE KHORASAN STONE

Some say that mention of the Bezoar Stone is found in the very earliest times, but that the ancients did not know its properties. They did, indeed, describe a stone found underground and relate that this stone was brought from Fars, which resembles the Bezoar in appearance and shape. But they used to make it into the haft of a knife and put it to no other purpose.

Some say that the best antidote is the Theriacum which the people of Khorasan have discovered. It is an antidote comparable to the Goat Stone and is called the Taryaq-i-Faruq-i-Tis or Theriacum of Goats. It looks like an acorn, being round and long, and is laminated. Within there is something which might be a kernel, but is merely a piece of wood or a seed. The colour of the Goat Stone is dust-coloured or blackish, inclined to be red. A good stone, when it is ground up with milk, will turn red. A bad stone, when powdered up, becomes green. The stone is obtained from the belly of the wild goat.

STONES OF OTHER REGIONS

The author of the Mufradat (or Medicamenta Simplicia)[2] states that the Bezoar Stone is taken from Khorasan alone; though this is not correct. Others state that the only place in which it can be found is Shabankarah and nowhere else.[3] This, too, is incorrect. For it is to be found in Hindustan, in Golconda, in several parts of the Deccan, and above all in Kanpura and the surrounding district. The Bezoar Stone of these parts frequently will weigh three or four tolas; as they do also in the province of Warankul. The majority of the sheep of those parts contain a specimen, which they export to Europe, China, and to Malacca.

In China there is a Stone derived from monkeys, the very kernel of which may weigh four or five tolas. One of these was bought for 500 shamuns,[4] which is the equivalent of 30 Persian tumans, and sold in the royal court. The buyer encrusted it in jewels. Another kind is the Stone from a cow, which is found in the Deccan. This is usually round and of little value. The Deccan Stone, besides being found encircling a twig, may also have as its core a tamarind seed or a bead, or even a piece of pottery or stone. The sheep are really a species of goat, which live in the desert or the hills. Similarly the Stones of Shabankarah are obtained from mountain goats.

The son of the author of the Mufradat in his marginal commentary writes "When my father in his Mafradat says that the Bezoar Stone can be brought only from Khorasan, he was speaking metaphorically; as were his remarks that Shabankarah is the only place in the world where it can be found[5] . . . and there also it can be found. The people of Shabankarah say that around their town there is some wood which has the properties of the Bezoar, which they call the Chub-i-Gaz (or Wood of a Yard). But that this is incorrect is easily demonstrated.

I, Mahmud, maintain that the food of these sheep is serpents and seeds. On account of the lack of water a stone forms in their bellies. And hence this type of Bezoar Stone is called a Natural Theriacum. Some believe that it is found in the Gall Bladder; but this is a mistake. The truth is that it is found in the ventricle of the goat. In any case, it is extremely rare and is sent away in every direction.

Some say that, when it is ground up, it may turn green or red or even yellow, and that these are called "the black colours," and that it is better when it is black or reddish.

In Syria they manufacture from lac something which resembles the Stone, so that even the learned find it difficult to distinguish the one from the other. The test is to heat a needle red-hot in a flame and to place it on the Stone. If it is an artificial Stone, as the needle sinks in, it will give out a black smoke; if it is a genuine Bezoar Stone, the smoke is yellow and the tip of the needle, too, will turn yellow.

I have also heard that it is found in the region of Kerman and that the Kerman stone is more muddy-coloured than the Shanbankarah Stone.

WEIGHT OF THE STONE

The weight, too, is a subject of dispute. I have seen them varying from a single grain to twenty miscals. The bigger they are the better. It is well-known that a little one may resemble the pip of a grape and that the weights may vary from a grain to twenty miscals and then not be complete. But this is of no importance; for great or small, whichever excells in its essence, is the best ([Marginal note.] I, Khalil, the physician, once saw one that weighed 30 miscals; the owner said that it was obtained from a cow. And God is omniscient).

DOSAGE

The dose of the Stone for one bitten, poisoned, or stung, is the weight of twelve barley grains; the dose for weakness of the heart and loss of sexual power is one grain. It is exceedingly useful. Anyone who takes a grain a day will be preserved from all illnesses and poisons. It is good, too, for hot temperaments, because it produces its effects by its properties and not by its constitution. For its constitution is exceeding hot. Anyone who wishes to make a practice of eating the Bezoar Stone ought to omit the drug on two days in each week.

A METHOD OF EATING THE BEZOAR STONE

Some have shown that the Stone, when eaten, should not touch the teeth, for it causes the teeth to break. The right way to take it is first to cleanse the stomach and body of humours, and then after a rest of three days to grind up every day two grains in milk or rose-water, so that after three days six grains will have been taken. A good hour later a draught of sugar and rose-water should be taken; and then about noon some pulse-water and bread may be eaten. The patient should after this avoid milk dishes, all bitter foods, and all that gives rise to obstruction.

ANOTHER METHOD

Take some Ethiopian aloes wood, a precious ruby, mastich, white ambergris, pure musk, gold and silver leaf, and white bamboo concretions. Grind up the drugs and put them through a sieve. Grind up the Bezoar Stone and the ruby, and mix them with the juice of a sugar-cane. Divide this into three portions and eat one portion each day. Then proceed as above.

Anyone who observes this method of taking the Stone at the beginning of the Spring and at the beginning of the Autumn, above all anyone of middle or advanced age, will find that his Innate Heat becomes increased, his bodily powers multiplied, and he will become immune to many poisons. It is exceedingly good, too, for phlegmonous and splenic diseases.

OPINIONS OF OTHER WRITERS

The author of the Jami[6] states that the word Bezoar has two meanings. In the first place it is the name applied to any substance which resists the power of another substance and drives out its evil effects on account of some property which is found within it. In the second place, it is the name applied to a well-known stone, which by some inherent property drives out poisons, both hot and cold, whether taken by the mouth or hung round the neck.

Aristotle wrote that the Bezoar Stone may be of many colours. Some are yellow, some dust-coloured, some khaki, and some are whiteish. The best of all are the yellow, and next come the dust-coloured.[7]

Rhazes writes that the Bezoar Stone is a yellow stone, soft in essence, useless as a food, and very useful as an antidote; and that he himself had seen the great use and potency of the Bezoar in driving away the poisonous effects of aconite. The Stone that he saw was yellowish or white and had fine hairs, like the hairs on the back of a fish. In its resistence to aconite no drug, simple or compound, that he had ever seen, could rival it.[8]

Ahmed Yusuf writes that the Bezoar Stone is hot and that in its heat lies its power. If the heart of a man becomes weak from sorrow, let him eat the sixth of a miscal and he will be helped and his heart strengthened. He writes also in his Jami that the animal which produces the Stone is the mountain goat. The properties of the Stone are so far superior to any other antidote that, if to-day half a grain of it be administered to a healthy man, no matter what deadly poison be given to him, he will receive no harm or damage therefrom. It produces no heat nor does it throw the humours together, in which respect it differs from the Mithridatic Theriacum and others. For it produces its effect by its own inherent qualities. Sometimes it is set in a gold ring and worn upon the finger. But the figure of a scorpion should always be engraved upon the Stone at the time when the moon is within the sign of the Scorpion. He says, too, that if a Bezoar Stone is exposed to the sun, it will sweat and run with water. To sip this sweat is very good for acrid fevers and for ophthalmia.

CONCLUSION

There is a stone which is brought from Khorasan and which is called the Bezoar Stone. There are also stones found in mines in the cities of China, India, and the West, which greatly resemble the Bezoar. But none of these have the properties and uses of the Bezoar. Among these are the Qanuri Stone and Marble. The genuine Bezoar Stone is a noble and precious stone. In a word, it is soft, but not excessively. This is noticeable to the touch. It may contain numerous fine hairs, all woven together. Its heat is not excessive. Its specific property is that it has the great power of being able to drive out all animal and vegetable poisons and cures the bites of animals. A weight of but twelve barley grains, powdered up and cooked and then swallowed, will drive out from the body all poison by way of the sweat and excretions, and will preserve from death. If a Stone is worked into a necklace or set in a ring and the wearer place it in his mouth and suck it after he has taken any poison, it will be very beneficial. Or, if the ring is rubbed over the place of the bite of a scorpion or flying insect or over anyone who has taken a poison, such as arsenic, or over wasp-stings, its use is evident. If it is powdered up and sprinkled over the place of the bite of any crawling insect, it draws out the poison. If the site of the bite has become infected before the remedy can be applied, even then, if the Bezoar Stone be drunk, the place will be made whole, the poison driven out, and the corrupt flesh renewed. If the sting of a scorpion be rubbed with the Stone, the poison of the sting is destroyed. If the weight of two barley grains be ground up and mixed with water and then poured into the mouth of a viper or snake, it will die of suffocation.

Written by the hand of the humble Mahomed Ali bin Saadi Ali Al-Hussein, the Physician, whose sins may God forgive.

NOTES

1. As far as I am aware there is no mention of the bezoar stone in the extant works of Hippocrates. Doubtless the author refers to one of the apocryphal treatises of which many were in existence in medieval times.

2. The name "Mufradat" is a common one and it is impossible to say to which he refers. There is, however, in the library of the India Office, London, a work entitled "Mufradat Dar Ilm-i-tibb." The author is not named nor is it dated. In Part III, the fourth chapter is "On Stones, mineral and otherwise"; so that this may well be the work to which our author is referring.

3. Shabankara is the name of a village near Tus in Khorasan, north-east Persia. Mahomed bin Yusuf Al-Harawi in his Bahr-ul-Jawahir asserts that Shabankara is the only place where the genuine Stone can be obtained.

4. I am uncertain what this coin is which I transliterate Shamun. The manuscript at this point is badly written and strange words are very difficult to read.

5. I can make no sense of this passage.

6. The reference here is to the "Jami-ul-Fawaid" of Yusuf bin Mohamed of Herat. I have not discovered the passage in this book, which has been recently printed in Meshed, but the same statement is made in the "Bahr-ul-Jawahir," which is the work of his father. Yusuf, the son, wrote several other medical works, and died about the middle of the sixteenth century, being therefore an older contemporary with the author of this pamphlet.

7. Presumably a reference to the spurious "Stone Book."

8. A translation of a portion of this passage is given in the introductory remarks.

ANCIENT MEDICINE IN MODERN PERSIA

By H. A. LICHTWARDT, M.D.

HAMADAN, PERSIA

SOARING above Persia's desert wastes in a swift Junker plane, and noting large auto-trucks rapidly conveying goods from the border towns to the interior, along quite passable roads accompanied by gleaming telegraph wires, one realizes that the ancient Persia, eloquently described by poet and prose-writer, has changed.

Teheran, and some of the other larger cities, have wide avenues lined by shops whose show-windows are filled with luxuries from various parts of the world. The old-fashioned, but ever picturesque costumes of ancient Persia are being rapidly supplanted by the twentieth century clothes of so-called civilization; clothes, which especially as concerns those for men, are as ugly, monotonous and uncomfortable as could be devised.

The Persian Parliament sitting in sessions more orderly and impressive than some of those reported from Washington or London, makes wise plans for the development of the educational system, amplifies the department of public health, and carefully plans a balanced national budget, for a land which many consider impoverished, but whose per capita national debt is far less than that of her European neighbors.

Lest the picture painted be too bright, or the impression conveyed be erroneous, one must leave the newly built motor roads, and on horseback, or afoot, go into the tiny villages hidden in the narrow mountain valleys; one must depart from the broad, well-lighted avenues of the large cities, and walk through dark winding alleys into the true native quarters, where progress is not evident, filth is prevalent and sanitation non-existent; one must ride out into the desert, where at a well, or at the side of a small stream, one may find Balooch tribesmen camping in their black, goat-hair tents, knowing nothing of modern civilization, and caring less. In all these places one soon realizes that there is still much of ancient Persia remaining.

Tens of thousands of villages have no doctor or medical care of any kind, and when a person becomes ill he first sends for the village mullah or priest, who may be the only literate man in this village of domed-top mud huts. This picturesque old man, with wrinkled but kind face, and long henna-dyed beard, sharpens his reed pen and writes a sympathetic prayer in Arabic, or an appropriate verse from the Koran. The paper containing this prayer or verse is then dipped in a glass of water, and the resulting inky solution-of-prayer is reverently drunk by the believing patient. Let us not scorn this ancient system of psychotherapy, based upon a rational faith in an omnipotent God and necessitated by an isolation from scientific medical assistance. There are many less scientific and less effective systems even in countries which consider themselves enlightened.

For definite diseases there are definite remedies; a person suffering from malaria will carefully shell eleven almonds and remove the inner skin; these nuts he will take to the mullah who will duly bless them, inscribe a few holy marks on their soft surface, and the patient faithfully takes three almonds the first day, four on the second and the remaining four on the third, after which (he hopes) his malaria disappears. It certainly is a much tastier treatment than the bitter quinine solution which we have taken, or the even more penetrating quinine injections which we have had given to us.

Should this treatment not be efficacious, this man, with his chills and fever, goes out into the desert at night, and listens to the howling of the jackals which will come quite near to the village in the darkness. The man pulls off his rope-like belt, and at each bark of a jackal he ties one knot in the belt; after seven barks and seven knots, he returns home with a shorter belt, but the assurance that his malaria will have disappeared.

The village barber (the type from which modern surgeons are descended) has an assortment of instruments, which includes, in addition to the implements of his tonsorial art, a hand-forged scissors and crude razor (*not* safety), a rusty knife with which to incise abscesses and the necessary instruments to "bleed" a patient. He may also be a "leech" or at least include in his therapeutical equipment those repulsive but efficacious black blood-suckers, who gave name to the ancient physicians. The modern doctor who has never used or even seen a leech, would marvel at the splendid results achieved with it in certain cases.

"A little knowledge is a dangerous thing" is very true as regards some of these barber-surgeons and their practices. A farmer was bitten in the calf of his leg by a snake; the barber who was called, in addition to applying some local treatment to the wound, wisely tied a firm tourniquet above that part of the leg which had been bitten. But unwisely he forgot to take off this tourniquet and two weeks later the man was carried into the hospital with his entire leg black with gangrene, the firm tourniquet still in place.

In the case of a broken bone, a professional bone-setter very appropriately called an "adhesion breaker," will be called in to reduce and set the fracture. These men, nearly always illiterate, ignorant of anatomy or physiology, and knowing even less of asepsis, are in a position to do much good, or much harm, to their helpless patient. Some, with surprising intelligence, have, by observation and practice, developed quite a commendable technique in the reduction of simple fractures of the long bones, and we occasionally see healed fractures, the end results of which would be approved by the most critical surgeon.

Unfortunately however these good results are in the minority and the crude "adhesion-breaker" with cruel force will convert a simple fracture, which might have healed without interference, into an ugly compound fracture, forcing the ends of the broken bones out through the skin. Not content with this damage he may apply a poultice of egg-yolk and cow-dung, introducing tetanus and other infections into this new wound which he has created.

The bone-setter realizes the advantage and necessity of a splint, but invariably it is applied too tightly, and not removed soon enough, and thus gangrene develops and the limb must be amputated to save the patient's life. Not a year passes but that we have three or four patients, usually children, requiring amputation of an arm or leg due to careless, cruel maltreatment by ignorant "adhesion-breakers."

Obstetrics is an unknown art in most parts of Persia, and the city as well as the village midwife equals the bone-setter in criminal ignorance, disastrous superstition, general filthiness and horrible results. The delivery of the anemic girl-wife is done on the dirt floor of the small one-room mud hut, which may have no other window than the hole in the top of the domed roof through which some of the charcoal fumes and smoke escape. Having first given the woman some harmless decoctions of carrot-seeds, sage-tea or bitter-sweets to hasten the labor pains, the dirty midwife, with unwashed hands, prepares to do her best. Kneeling on the dusty floor, the patient lying on old rags, repeated examinations are made, and with justified groaning and shrieks the job is finished. Should it be a difficult delivery other old women are called in to help, and without anesthesia of any sort, they endeavor by force, by prayers, by charms to aid nature.

The results can be easily imagined; unspeakable suffering and misery, horrible infections with great mortality, permanent invalidism. This is not primarily the fault of the midwife; she, in her ignorance does the best that she can; it is because there are no trained qualified midwives available to do this work.

Preventive medicine is also practiced, but not the type of which we can approve. Every fall and spring, many believe that blood should be taken, and even anemic, emaciated little children near death from dysentery, malaria or malnutrition are subjected to this therapy. Nearly every village has its official bleeder, usually a toothless, wrinkled old woman, who possesses as instruments only an old rusty knife and the hollow horn of a goat or cow. The usual place of bleeding is the middle of the back, but the treatment may be given on the face or whatever part of his body the patient selects. Without any preliminary cleansing of the skin, several parallel incisions are made, and the large open end of the horn is placed firmly over these bleeding cuts. The old woman then applies her mouth to the other end of the horn, and by sucking creates a vacuum, so that the horn fills with blood rapidly. 'Tis then emptied on the ground, more sucking, more blood, and the treatment is often continued until the patient falls over in a faint from weakness. For a person with increased blood pressure, or some few other special conditions, such treatment carried out under aseptic conditions might be beneficial, but for the poor, anemic, under-nourished folks who submit to it, it is often disastrous. Even the lepers, barely existing on their allowance of thirty cents a month, will spend a cent or two each spring and fall to have their unclean blood sucked out!

The village mullah will write prayers not only to cure disease, but also to prevent it; these prayers are worn in little leather bags or silk cases, tied on the upper arm. A most "satisfactory" preventative of disease is to have a prayer written on very thin fawn-skin and placed under a skin flap of the upper arm, this skin flap then being sewn down over the prayer. This graft if it takes is considered a most efficacious charm.

Another and less strenuous type of preventive medicine, consists of wearing a chain of miscellaneous charms about the neck. These attractive necklaces of beads, bones, shells and stones can be seen on most village children, and have been carefully gathered by the loving mother, who will gladly tell you of the efficacy of each. Here is the dried eye of a sheep which has been killed as a sacrifice, worn that the "evil eye" may not strike the child; this brown ring is the piece of the horn of a mountain sheep and will keep away contagious diseases; for the special prevention of whooping cough a brief prayer is written on a small piece of dried squash skin; the knee-cap of a wolf is attached to make the child swift of foot; a small sea-shell is included that the youngster may never know fear.

Simple remedies that have been handed down from generation to generation, are used on the advice of the old women; a child with a purulent conjunctivitis is treated with fresh mother's milk squirted directly into the eye (good, sensible treatment this, for it is a sterile, convenient, mild antiseptic). For sore throat dried dung of the donkey is burnt in a closed room, and the patient inhales the fumes. Headache is wisely treated by rest and hot foot-baths, and a saline cathartic is also recommended.

Wounds, ulcers and open sores are dressed with green leaves some of which may have some definite therapeutic value. The leaves of the hollyhock are considered very healing, as are the leaves of the "mirabilis jalapa" (marvel of Peru). Villagers living near the sea or near a river or swamp are very fond of using the leaves of the waterlilies, while all of them think highly of the leaves of the marigold, which in the Persian language has the very pretty name "always springtime." These various leaves are probably less harmful and surely much cleaner than the pieces of dirty paper which they often stick over their wounds, often the first piece of old paper they can pick up in the street, sometimes a carefully written prayer. With the arrival of products of western civilization these too are used, and when a man came in with his ulcers covered with a thick black mass, and was asked what it was, he proudly replied "mobiloil."

One mentions all these details of the present-day practice of ancient medicine, not to condemn, but merely to record, and if possible to encourage the spread of knowledge of hygiene and sanitation. It is surprising and encouraging to note the endurance of the average Persian patient; his amiability toward treatment and his appreciation of sufferings relieved. Much is being done to improve present health conditions, and year by year definite advances are being made. Government doctors are being sent to the smaller towns to give free treatment as well as to supervise simple measures of preventive medicine; hospitals are being established, or present institutions enlarged; a school for midwives is being started in Teheran, and the Imperial Medical School located there is gradually being improved; *x*-ray facilities are now available in several centers; free smallpox vaccination is being carried out throughout the land.

The day will come when ancient medicine will be but a tradition, when the terrible sufferings of childbirth will be but a memory, when the present shameful infant mortality will be greatly reduced, and when through a general knowledge of the principles of hygiene and sanitation, and available facilities for prompt, proper treatment of disease, there will be much less suffering and morbidity in this ancient land of sunshine, Persia.

ST. FRANCIS AND MEDIEVAL MEDICINE

By EDWARD F. HARTUNG, M.D.

NEW YORK CITY

FRANCIS of Assisi is considered by many thoughtful men to be one of the great figures of history. He is in a real sense the quintessence of the Middle Ages and especially of that most happy century, the thirteenth. St. Francis typifies most that is best in human nature—inexhaustible love especially for the frail and less fortunate, thrilling power to inspire men and lead them, natural cheerfulness and song, and a deep almost pantheistic love of nature and things. He was a supreme mystic who communicated by a sixth sense with the spirit of man and nature.

These notes are written mainly to throw a little additional light on the diseases and medical treatment of the thirteenth century. They also draw together for the first time, as far as I am aware, the medical history of St. Francis. Certainly no one with medical training has critically scanned the ancient manuscripts, as is very obvious from the scattered, fragmentary references to St. Francis' physical state. Of course the main value of St. Francis is spiritual and mystical and an overbearing emphasis on his physical state is somewhat out of place. However, for the reasons just stated and a few others which will be apparent later, I think the subject of considerable interest.

In order to appreciate the medical history of St. Francis, a few details of his life and activities will have to be stated here and there. He was born in 1181 or 1182 and died in 1226 at the age of forty-five. Up to the age of twenty-five he lived a typical life and received the average education of a son of a prosperous cloth merchant of the times. About this time he had a serious illness, the details of which are indefinite, and during convalescence from this, received the religious inspirations that guided the remaining twenty years of his life. Immediately he started out on a life of the most strenuous and devitalizing character, and this in addition to the early contraction of a quartan malarial infection, explains to a great extent his subsequent illness. Complete poverty was his ideal, not for everybody, but for those who would lead men to God. Obviously this was a reaction to the simony and wealth of the churchmen of that day. For St. Francis, it involved giving up every human comfort, in any way physical. He owned and used as little as possible. A picture of him and his disciples at Rivo Torto during the short but uncomfortable winters of Umbria is typical. "On dark and rainy days, when the water drove in through the leaky roof of the shed and the earth floor was black and miry and cold for the bare feet to tread upon, they sat there in their coarse ragged gowns, seven or eight in number, and had nothing to eat all day—and there was no fire to warm them and no books to read." It is stated on reliable evidence that Francis once kept Lent on a small island in the Lake of Perugia where he fasted forty days and nights and ate no more than half a loaf of bread.

With such constitutional misusage he was a fit subject for any chance infection. What he contracted was quartan malaria. About what date is not clear but certainly it went back as far as 1214. On an evangelical trip to Morocco that year he was so severely ill, that he had to return home,[1] but early evidence seems to point to the fact that the infection was of Italian origin contracted somewhat before this. His subsequent days were more or less a fight against this infection. Scattered throughout the contemporary manuscripts dealing with his life there are incomplete notations as to this or that phase of his health. No one of his contemporary historians or of recent writers has attempted or apparently thought to unify the cause of these illnesses, superficially so diverse. But having a clear statement from two or three contemporary sources as to his actually having had quartan fever[2] the rest of his medical history is explainable on this basis alone, with the exception of his eye malady, and possibly the stigmata.

In 1219 St. Francis went to Egypt to convert the Saracens. At that time the Crusaders' army lay before Damietta. After much ill treatment he was finally allowed to interview the Soldan, Melek el Kamel. The trip was barren of results. He contracted here, however, what was called the Egyptian eye sickness and "from the time he returned from overseas he had great pain in his eyes continually."[3] He arrived in Venice in July, 1220, and after this grew progressively weaker.

The following year (1221) we find him rising on a certain day to receive a castigation he thought necessary "although" as the manuscript says "he was not entirely free from quartan fever."[2]

During 1224 it was noticed that "he began to suffer from diverse ailments so grievously that scarce one of his limbs was free from pain and sore suffering. At length by diverse sickness, prolonged and continuous, he was brought to such a point that his flesh was wasted away and only as it were the skin clove to his bones."[4]

Toward the end of this year he planned to go to Mt. La Verna to celebrate the feast of St. Michael. He was too much exhausted to think of making the journey on foot and a horse was put at his disposal. It was at La Verna that he received the stigmatization about which more will be said later.

In 1225 he became worse and was threatened with loss of sight. The Pope Honorius III was staying at Riete (April, 1225 to December, 1226) because of an uprising of the Romans and his arrival probably drew several physicians of renown to the town. Thomas of Celano also adds that the physicians there were of good repute in their profession.[5] Cardinal Ugolini urgently requested Francis to come to Riete for treatment. He hesitated a long time notwithstanding the entreaties of brother Elias, who was titular head of the order. Elias is quoted as saying, "The most High hath created medicine out of the earth, and the wise man will not shrink from it."[6] Here might be the place to speak of Francis' attitude toward disease. It typifies to some extent the frequent viewpoint of the times. In one place Francis says to the complaining leper, "My brother be patient, for God gives us diseases in this world for the salvation of our souls, and when we endure them patiently, they are the fountain of great merit to us."[7]

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[1] 1 Cel. 56, Bon. 132.

[2] S.P. 61.

[3] S.P. 91.

[4] Bon. xiv 2.

[5] 1 Cel. 105.

[6] 1 Cel. 97.

Instead of proceeding to Rieti, Francis first went to Damian to visit St. Clara. He stayed there from July to September, 1225. His arrival was marked by a terrible aggravation of his malady. For sixty days he could not distinguish light. The aggravation is not surprising when we read the old manuscript which describes his visit. Says the "Speculum Perfectionis"[8]:

> Two years before his death, while he was at St. Damian in a certain cell made of reeds, and was greatly afflicted by the infirmity of his eyes so that for more than sixty days he was not able to see the light of the fire, it happened, that by the divine permission, so many mice came into his cell for the increase of his affliction and for his merit, that they, running about over him in that cell by day and by night, allowed him neither to pray nor to remain quiet, nay, when he was eating they climbed upon his table and worried him very much.

Finally, however, St. Francis arrived in Rieti and accepted the hospitality of the Bishop's palace. His appetite was gone and his tastes for the first time capricious. He said, "I have no will to eat, but if I could have some of the fish called squail (squalus) perhaps I could eat it."[9] He was also offered crayfish[9] (gammarus) as a delicacy. Finally he was taken to a hermitage just outside the city. Then the eye doctors (*medicus oculorum*)[10] started to work on him and, apparently, from the manuscript, there were eye specialists in attendance. No attempt was made to cure his malaria and, as a matter of fact, throughout all the manuscripts not one treatment was even suggested. What they did for malaria in those times when the fens and swamps of Italy were infested with it I do not know. There are, however, specific details of his eye treatment. They first tried eye bindings and salves and plasters,[11] the details of which are not mentioned. They also tried to reform his way of living and in this they succeeded to some extent. "Has not," they said, "thy body all through life been a good and willing servant and ally, how then hast thou treated it in return?" Finally Francis said, "Rejoice, brother body, and forgive me, now I am ready to humor you in your wishes."[12] Unfortunately, however, his determination to change his mode of life came too late.

Conservative measures did no good and the physicians now decided to resort to cauterization. A direct quotation from the "Speculum Perfectionis" might be of interest.[13]

> On a certain day the physician came to him, who, considering the disease, said to Blessed Francis that he would make a cautery over the jaw up to the eyebrow of that eye which was weaker than the other. And having placed the iron in the fire to make the cautery, Blessed Francis, wishing to strengthen his spirit lest he should faint, spoke thus to the fire, "My brother fire, noble and useful among all

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[7] Fioretti xxv.

[8] S.P. 100.

[9] S.P. 111.

[10] S.P. 110.

[11] 1 Cel. 101.

[12] 2 Cel. 160.

[13] S.P. 115.

other creatures, be kindly to me in this hour—but I pray our Creator who created us, that he will so temper thy heat that I may be able to sustain it." We who were with him then did flee, out of pity and compassion for him, and the physician alone remained with him, but when the cautery was made we returned to him, who said to us, "Oh cowards and of little faith, why did you fly, in truth I say unto you, that I have felt no pain nor the heat of the fire; nay, if it be not all burnt now let him burn the better." And the physician marvelled greatly—for all the veins from the ear to the eybrow had to be cut open. It did him no good. Likewise, another physician bored through both his ears with a red hot iron,[14] and it benefited him nothing.

That these cauterizations were not child's play, is evident from a later remark of Thomas of Celano: "Now he wore the cap of sack cloth on his head to cover the scars which had been produced by the treatment he had undergone for his eyes."[15]

It is stated that there was slight amelioration somewhat later. This did not last long, however, for leaving Rieti we see him in Greccio where he is quoted as saying one day: "Brother, I have not been able to sleep this night, neither to stand erect at prayer for my head and hands tremble very much, and it seems to me that I must have eaten darnel bread."[16] This shows a recurrence of the abdominal pains that he was to complain of more and more. As the "Speculum Perfectionis" says: "for a long time up to the day of his death, he had suffered ailments of the stomach, liver and spleen"[17] and they, together with the hemorrhages and dropsy,[18] described later, make one feel certain that the malarial infection had reached a malignant stage and that he had that enlargement of the spleen and liver that follows a long malarial infection, in other words, the ague cake spleen that used to be so common in the fen districts of Italy and is now so rare. The hematemesis described is also characteristic of this stage of the disease.

In January, 1226, we find St. Francis in Sienna. Sienna was noted then as now for its mild air. He was escorted there by a certain physician who was attached to the Order (*quemdam ordini obligatum*).[19] The records are silent as to the details of his life there, but definitely say he went for the cure of his eyes.[20] Ophthalmology was by no means an obscure subject there. We do not know the eye authorities who resided there in 1226, but history tells us that one of the greatest ophthalmologists of the Middle Ages, Petrus Hispanus, later elevated to the Pontificate as John the twenty-first, was a teacher of medicine in Sienna, in 1247 (about twenty years later). He wrote a famous book, "Liber de oculo," manuscript copies of which still survive. It has been translated into German by A. M. Berger. From this we may gather an idea of the type of treatment Francis might have received and the knowledge of the men who treated him. Weird and absurd though much of the therapeutics may seem to us, a perusal of the work shows us that there was a great deal known then which we still consider of value.

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[14] S.P. 115, T.M. 14.
[15] 1 Cel. 162.
[16] S.P. 98, 1 Cel. 34.
[17] S.P. 91.
[18] S.P. 122.
[19] 2 Cel. 93.
[20] 1 Cel. 105.

Tastes have changed. We no longer use the urine of an innocent boy (*urina virginis pueri*) as an eye wash, as Petrus recommends, but many of the basic principles of his therapy hold good today. An excellent sketch of Petrus Hispanus has been written by David Riesman.[21] As another evidence of the state of ophthalmological knowledge of this period, we find that before the end of the century Bernard Gordon of Scotland, a physician teaching at Montpellier, had devised spectacles for defective vision.

That Petrus Hispanus was not a lone light but merely a link in the chain is also obvious from his own acknowledgement of indebtedness to preceding authorities. He mentions with respect Theodore, probably physician to Frederick the second, as well as Avicenna, Rhazes and others.

From Sienna Francis went to Cella di Cortona. Here in the early part of 1226, he developed hemorrhages which reduced him to extreme prostration, and for the first time he noticed dropsy. It is specifically stated that he vomited blood.[22] He could hardly retain anything on his stomach and he had severe pain in his spleen and liver. He improved somewhat in spite of everything and made a new effort to return to active life. He returned to Umbria, but the body faltered where the spirit was willing. The swelling which had shown itself in the lower limbs was rapidly going to the upper parts of the body. "But if I had a little fish," he said, "I believe I could get it down." Another time he had a desire in the middle of the night for some leaves of parsley.[23] One can picture one of his disciples obedient to his wish, fumbling about in the garden in the darkness for parsley leaves.

Toward the end of the summer of 1226, he was taken to the palace of the Bishop of Assisi and guarded carefully by soldiers in order that on his death his relics would not be stolen by the neighboring and competitive town of Perugia. After a few days of relative improvement, Francis' sufferings grew greater than ever. He had grown worse with frightful rapidity. He would have hemorrhages and then again grow better. No one could understand the resistance to death offered by this body so long worn out by suffering. Francis came to that almost cessation of pain which so often precedes the approach of the last catastrophe. One biographer said that "as the natural heat was being gradually lost, he was daily drawing near the end."[24] He requested an old friend, the Lady Jacqueline of Settesoli, to send him some of the sweetmeat which she had often made for him in Rome. The Romans called this sweetmeat "mostaccioli" (in Latin *mortariolum*). It was made of almonds, sugar or honey and other things. She came to Assisi, but when she prepared the dish which St. Francis had desired, he ate little of it.[25]

A medical prognostication is recorded as occurring during these last days. The quotation as recorded in the "Speculum Perfectionis" might be interesting:

> There visited him a certain physician of Arezzo, who was very familiar with blessed Francis. And Francis questioned him, saying, "What thinkest thou, Bem-

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[21] Ann. Med. Hist., 5: 291, 1923.

[22] 1 Cel. 105.

[23] 2 Cel. 22.

[24] 1 Cel. 107.

[25] S.P. 112.

benignate, of this my infirmity of dropsy?" And the physician said to him, "Brother, it shall be well with thee, by the grace of God." And blessed Francis said again, "Tell me the truth; what do you think? I am no faint-heart that I should fear death." Then the physician said to him openly, "Father, according to our medicine-craft thine infirmity is incurable."[26]

On October 3, 1226 at the age of forty-five Francis passed away calmly and without pain.

We might mention here the stigmatization. About two years before his death, while observing a fast in honor of the feast of St. Michael on a lonely mountain called La Verna, St. Francis received on his hands and feet and on his chest, so the legend goes, the marks of the crucifixion. Some of his companions on the mountain, notably brother Leo, saw the wounds just subsequent to the event. Sabatier, one of the greatest Franciscan students and commentators, a man of keen intellect and critical studiousness, feels that without a doubt St. Francis had marks on his body suggesting stigmatization. He does not attempt to explain it, but ventures the remarks that so-called miracles may be explained as circumvention of natural laws, or, while the result of natural processes, the details of their working may be at the time beyond our knowledge. He leans, as must we, to the latter explanation.

The detailed description of the marks of stigmatization as received by Francis vary greatly in the contemporary manuscripts. "All the testimony," says Sabatier, "agrees in describing them, with the exception of the marks on the side, as blackish, fleshy excrescences like points of nails clenched by a hammer. There was no bloody exudation except at the side."

There is one suggestion I would like to offer in regard to the stigmatization, not as a definitive explanation, and certainly by no means proved. It is this. We have seen that all of Francis' illness with the exception of the eye malady, may be explained with good reason on the basis of quartan malaria of a chronic malignant type. There is one other complication of quartan malaria not yet mentioned and not seen frequently today, but occasionally met with in the past before the advent of adequate treatment. That is purpura. We know that purpura occurs as a complication of malaria, that it is usually distributed symmetrically, that its usual location is on the hands and feet, and that it appears as ovoid, bluish, at times slightly elevated spots.

To sum up we might say that the clinical picture of St. Francis' illness as culled from the text is not so well explained by the other common parasitic diseases. Some of the more important of these might be mentioned. The recurrent attacks of diarrhea associated with anemia and emaciation in bacillary dysentery of the chronic type would not account for the chief symptoms. Hookworm disease (ankylostomiasis) is also an inadequate explanation. In amoebiasis the dysentery of course does not always dominate the picture. There may be occasional attacks of bloody diarrhea with abdominal pain and tenderness and the hepatitis is not an uncommon complication. Occasional periodic rigors result in a resemblance to malaria.

Infestation with Schistosoma, particularly S. Mansoni, may result in involvement of the liver and spleen with enlargement of these organs, abdominal pain, anorexia and later hematesis, edema and ascites. Purpuric rashes may also occur in later stages. Schistosomiasis, also called bilharziasis, is known to have existed in Egypt even in antiquity.

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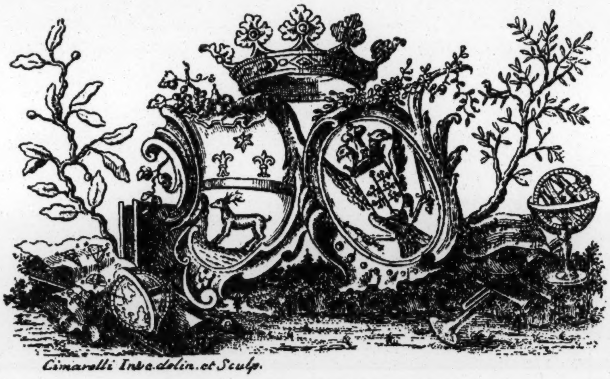
[26] S.P. 122.

Cancer also might be mentioned as well as heart disease. Neither these nor any of the parasitic diseases just mentioned, would give a recurrent quartan fever so distinct and regular in periodicity as to be remarked upon by laymen such as wrote the ancient chronicles; and in addition the implications of the text make one feel that those about him were familiar with and took almost for granted, as if they had been observed for a long time, a quartan recurrence of fever in their leader.

REFERENCES

The chief works drawn upon for this contribution, together with the abbreviations we used in the footnotes, are listed below. Where translations only were consulted, the fact is indicated.

1. I Cel., II Cel., T.M., Legenda Prima et Secunda, S. Francisci Assisiensis, Vitae et Miracula Thomae Celanensis. Ed. P. Eduardus Alenconiensis, Rome, Desclee, 1906.
2. S.P., Speculum Perfectionis (attributed to Brother Leo, secretary and companion of St. Francis). Ed. Paul Sabatier, 1928.
3. Fioretti di San Francesco. Trans. of T. Okey. London, Dent, 1910.
4. Bon., Bonaventura, Legenda Major. Trans. of E. Gurney Salter. London, Dent, 1910.


Cimarolli Inv.e delin. et Sculp.

[From Redi: Opere. Napoli, 1778.]

[From Fabricius d'Acquapendente: Opere Chirurgiche. Padova, 1684.]

EDITORIAL

TO OUR FEW SUBSCRIBERS AND MANY READERS—GREETING

WITH the present number the Annals of Medical History enters upon the seventeenth year of its life. It was conceived and born in troublous times, the first issue appearing a few months after the United States entered the World War.

For many years prior to the publication of the Annals of Medical History there had been manifest a growing interest in the history and cultural aspects of medicine and there appeared to be a demand for a periodical which would serve as a vehicle for the publication of the constantly increasing literature on such matters. A journal of this nature was obviously a risky venture from the commercial standpoint and it is remarkable that a publisher was found who was willing to undertake the project. There are so many medical journals to which doctors feel that they have to subscribe, and so many medical libraries where the journals to which they do not subscribe can be consulted, that there was grave doubt as to how many would be found willing to subscribe to a new journal which might not be regarded as absolutely essential to their professional work. Undaunted by such suppositions the publisher not only proceeded to carry out his plan to publish a journal devoted to medical history, but determined that it should be conducted on the highest plane and produced in the handsomest way. A number of the foremost scholars were kind enough to lend their patronage as members of a board of associate editors, and from the outset to the present time no effort has been spared to secure nothing but the highest class contributions to its pages. The best paper and type were used in the printing and every issue was adorned with many beautiful illustrations. Further no advertising matter was published in its pages. In other words the profession was offered a splendid publication with the highest class of literary material, and free from any commercial taint. On every side throughout its existence the Annals of Medical History has been praised and its publisher commended.

Unfortunately there is another side of the picture. The subscription list did not keep pace with the encomiums. "Kind words butter no parsnips." Many of those who were most lavish in their praise of the appearance, contents and utility of the Annals, even those who used its pages as a vehicle for their writings, did not see fit to contribute towards its maintenance by subscribing themselves or bringing it to the attention of those who might be willing to do so. As was to be expected during the last few years there has been a marked diminution in the number of subscribers. Consequently the ANNALS is faced with the unpleasant possibility that it may have to suspend publication, at any rate until the dawn of better times. This step can be obviated if those who really have the interests of such a publication at heart will aid in its continuance by using every effort to increase the number of its subscribers. If not able to subscribe individually it is possible in many instances to get the local medical society to do so. Very often a small group of men can each contribute a small sum towards a subscription for the society. If the ANNALS should suspend publication it will be many a long year before a publisher will be found of sufficient courage and disinterestedness to undertake a similar project. *Verbum sap.*

FRANCIS R. PACKARD.

SIDE LIGHTS ON MEDICINE IN A PIONEER TOWN

TO the vast mass of literature concerning Abraham Lincoln there has recently been added a valuable little contribution describing New Salem,[1] the frontier town to which Lincoln came in 1831, and where he lived for the subsequent six years. At that time it was an active little town with prospects of future development, but these prospects proved fallacious for various reasons and the town practically ceased to exist in 1840 because of the moving away of its inhabitants to other more prosperous places. It was located on the Sangamon River, in the county of the same name in Illinois.

Lincoln was twenty-two when he came to New Salem and the years in which he lived there were formative and most important in his life. In recent years the Old Salem Lincoln League was organized and with money contributed from private sources and a liberal grant from the State of Illinois, the town of New Salem has been as far as possible reconstructed as it was in the time when Lincoln was one of its most active citizens.

The thing of special interest to us in Mr. Thomas's book is the part in which he throws light upon the medical affairs of the town. At the height of its prosperity New Salem contained about twenty-five families, whose medical needs were looked after by two physicians. Of Dr. Francis Regnier, from Ohio, who lived in a house with but one room in which he not only slept and ate but also saw his patients, but little is known. His house has been reproduced and its picture is contained in this book. The other physician, Dr. John Allen, was a graduate of Dartmouth. He was deeply religious, an ardent temperance advocate, and a rigid Sabbatarian. His house, which is also pictured as it has been restored, was larger and much better constructed than that of his colleague. It was sometimes used for educational and religious purposes. Both physicians treated their patients in accordance with the practice of the time, purging, bleeding, doses of 20 to 100 grains of calomel, and other drastic measures were in vogue. Mr. Thomas describes some of the domestic remedies in common use: "A piece of fat meat, well peppered, and tied around the neck was a common treatment for colds and sore throat. A bag of slippery elm over the eye was supposed to draw out fever. Raw potato poultice was tried for headache. The breaking out of eruptive diseases was hastened by doses of a concoction made from sheep dung known as "nanny tea." A seventh son could supposedly cure rash by blowing in childrens' mouths." Although Mr. Thomas has not paid special attention to medical affairs the few pages he devotes to them are of interest and value and the pictures of the two doctors' houses, as the interiors have been restored, are very realistic of the conditions in which these men lived and practiced.

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[1] Thomas, B. P. Lincoln's New Salem. The Abraham Lincoln Assoc., Springfield, Ill., 1934.

As a study of an important period in Lincoln's life the book has great worth.

ERRATUM

IN the November, 1934 issue of the ANNALS, page 561, line 13, the name of the translator of "Jons Jacob Berzelius" should read Olof Larsell instead of Olaf Larsen. The error has also been carried over into the Index.

BOOK REVIEWS

Il "Libro pro Sanitate Oculorum" di M°. Davide Armenio, Oculista Salernitano del Secolo xii. (Noto come "Tractatus de Oculis Canamosali.") By Noè Scalinci. Napoli, Casa Editrice Libraria V. Idelson, 1934.

In this most interesting treatise Dr. Scalinci proves that the treatise on diseases of the eye which was printed in a number of editions of medical fasciculi published in Venice about the beginning of the fifteenth century has been falsely attributed to an Arabian author under the name of Canamosali or Accanamosali, and usually entitled "Tractatus de Oculis Canamosali," whereas it is really the work of an oculist of the Salernitan school named Davide Armenio. Dr. Scalinci has carefully studied the original works of both Canamosali and Armenio in a number of manuscripts as well as printed editions and we believe he has succeeded in demonstrating that the treatise in question was the work of one Davide Armenio, who at least studied at Salerno, and probably taught there. His searching analysis of the treatise is a valuable exposition of the ophthalmology of the day. The book contains a number of excellent illustrations.

Geographie und Geschichte der Ernährung. By Dr. Med. K. Hintze. Leipzig, Georg Thieme, 1934.

This is the first exhaustive study of the history and geography of nutrition and is characteristically German in its scope and thoroughness. The food sources and eating habits of practically all races and nations are discussed: Europe, China, Japan and the other Asiatic peoples; Africa, North, Central and South America and Australia. America at the time of Columbus had no grain, only maize. Probably the first grain used by man was barley (Hordeum). Where this originated is not known; some think in Asia, others place the source in Abyssinia or in the region of Nepal. Wheat is also one of the oldest known food grains. Its origin, like that of barley, is unknown and probably will remain so until a wild form of these grains is discovered. (The reviewer is under the impression that this has been done in the case of wheat.) Oats and rye are much younger than the other grains; the primordial home of the former is central Asia or the borderland and between Asia and Europe. Rye seems to have originated in a wild form in Anatolia and Turkestan. Buckwheat, which has its home in the interior of Asia, has never become an important staple in Europe, Russia being almost the only country in which it is a common element of food.

In a brief section the origin and spread of vegetarianism is dealt with; Pythagoras apparently was its protagonist; Seneca advocated it. The Roman Catholic church in its desire to inculcate moderation in the eating of meat has instituted fast and other restricted days. The Trappists, a religious order, live entirely on a meat-free diet. Japan, China, India also have sects which are rigidly vegetarian.

The last chapters deal with geophagia, dirt eating, at one time a widespread custom, and with placentophagia, prevalent among animals but in the human race confined to the males of one or two very primitive tribes.

David Riesman.

To Remind, a Biological Essay. By Sir William Bate Hardy. The Abraham Flexner Lectures, Ser. No. 2.

THE PRINCIPLES OF THERAPEUTICS. By Francis Richard Fraser. Abraham Flexner Lectures, Ser. No. 3. Published for Vanderbilt University. Baltimore, Williams and Wilkins Co., 1934.

Although not strictly historical in their nature these two volumes are such valuable contributions to the cultural aspects of our profession that we feel they demand notice in the ANNALS. The Abraham Flexner Lectureship was established by Mr. Bernard Flexner at Vanderbilt University in 1927 as a tribute to his brother's services in the elevation of the standard of medical education, their chief object being to contribute to the maintenance of the high ideals which Abraham Flexner had labored so earnestly to further, and both these series are admirably adapted to fulfill this aim.

Sir William Bate Hardy was one of the most distinguished of English physiologists of the school of Michael Foster. The lectures published in this volume were delivered by him in 1931. Owing to illness Sir William was unable to prepare the series in its entirety for publication and at the time of his death but two were finished. The title chosen for the volume is most appropriate, "To Remind," as Sir William's purpose was to recall the various steps by which our conceptions of the processes of life have been modified during the one hundred years which have elapsed since Dujardin gave the name "sarcode" to the plastic homogeneous substance, which subsequently become more generally known as protoplasm. From this as a starting point he passes in necessarily hasty review the various views which have prevailed from that time to the present as to the essential properties of living matter, reviewing the problem as studied by the biologist, the physiologist and the chemist and showing how so far the explanation of the organic basis of animal life has baffled the best efforts of all scientific workers. It is greatly to be deplored that the concluding part of these most stimulating and interesting lectures is lost because a summary of his views after reviewing the entire subject would have the greatest value.

The third series of the Flexner Lectures by Dr. Francis Richard Fraser, Professor of Medicine in the University of Edinburgh, the "Principles of Therapeutics," is an absorbing volume. The first chapter passes quickly over the various therapeutic measures practiced by primitive peoples and the therapeutics of the Egyptians, Greeks, Romans and Moslems, showing how no real progress could be made in therapeutics until Vesalius and Harvey had corrected the erroneous anatomical and physiological conceptions of their predecessors, and Morgagni had shown the way to study morbid processes in the dead body, after which therapeutics could be based on rational principles, and modern therapeutics came into being. Chapters II and III deal with the treatment of the causes of disease, passive and active immunity, toxins and antitoxins, vitamins and deficiency diseases, chemotherapeutics, and the use of surgery as a specific form of treatment. Chapter IV is devoted to treatment based on symptoms, rest, physical therapy, digitalis, hypnotics and drug idiosyncrasies. The last chapter is given to a consideration of the relation of the patient to his environment and of the responsibility to the patient of the physician, hospital and private practice, and temperament and emotion as causes of ill-health.

It would be a good thing if this book were placed in the hands of every student of medicine, to be by him read, learned and inwardly digested. It deals so wisely with so many problems which will confront him in his subsequent career that it would certainly enable him to avoid some of the pitfalls by which his path will be beset.

AMERICAN MEDICINE. By Dr. Henry E. Sigerist, William H. Welch Professor of the History of Medicine, the Johns Hopkins University. Translated by Hildegard Nagel. N. Y., W. W. Norton, Inc., 1934.

This book is a translation from the German of Dr. Sigerist's "Amerika und die Medizin," which was published last year in Leipzig, and reviewed in the ANNALS OF MEDICAL HISTORY.* The author states that, with the exception of a few minor corrections, he has not changed the text, accordingly an extended review of its contents is not necessary at the present time, but now that it is available to the American student attention should be directed to some of its most salient characteristics. Dr. Sigerist has not undertaken to write a systematic history of medicine in the United States but he has written a most excellent consecutive narrative in the course of which he devotes occasional chapters to epoch-making events or features. The author's outstanding ability as an historian by profession is too well known to require comment, but it is remarkable how fully he comprehends and appreciates the various factors which complicate the study of American medical history. Whether he is writing of the Colonial period with its apprenticeship system of training medical men, or of the cultured younger men who went abroad in the latter half of the eighteenth century to study in London and Edinburgh and bring back the medical traditions and practices of those centers to America, or of the group of pioneer doctors who founded medical schools in the West and South during the middle years of the last century, or of the research workers and great clinicians of later years, Dr. Sigerist knows all about their work and has the judgment and insight to appreciate both their virtues and failings.

Several chapters are especially noteworthy. Chapter v, on "Medical Education" tells a sad story of the falling away from the high ideals of the first American medical schools with the outcropping of proprietary medical colleges in the middle of the nineteenth century, and then relates the reformation which followed Abraham Flexner's epoch-making report. Chapter vii on "Hospitals and Nursing" is an interesting review of an important subject. In Chapter viii, "Preventive Medicine," there is a brief but excellent discussion of the efforts which have been made in this country to combat tuberculosis, venereal disease and other menaces to the public health. The last chapter, "Medical Science," contains a resumé of the work of the various institutes which have been founded on such a magnificent scale to forward research.

The book is well illustrated throughout and an excellent bibliography and good index conclude this most valuable and interesting contribution to American medicine.

THE DOCTOR IN HISTORY. By Howard W. Haggard, Associate Professor of Applied Physiology, Yale University. New Haven, Yale University Press, 1934.

In the Preface to this book the author states that his aim has been to write a "history of health," meaning thereby a history of man's constant struggle against disease from the earliest times to the present day, a terrific struggle from the beginning. As he says it is not a sentimental story of a "good fight" for humanity's sake, but "a grim tale of man's ignorance and hope, his life and death." Dr. Haggard's previous works on the history of medicine have demonstrated how completely he is a master of his subject and the powerful charm with which he writes of it. This most interesting volume is really an outline of the history of mankind as it has been affected by the status of medicine at various epochs, and the way in which disease, epidemic or otherwise, and the methods and measures used to combat it, have influenced human history from prehistoric times to the present. More and more the importance of this phase of history as it relates to individuals or masses of people and its bearing on human progress, political, civil or military affairs is being recognized, and Dr. Haggard is to be thanked as well as congratulated on his successful effort to present to the lay public as well as to the profession a work in which the history of the various races of man is summarized in relation to the medical conditions which prevailed at various times among them. The book is one which every layman should read with pleasure and profit as it will furnish him with many new and valuable lights on historic matters. To the student of medical history it will serve as a guide towards the realization of the importance of his subject to general history. Of late there has been a great increase in the number of books published on medical history, but we think Dr. Haggard's book is unique as a presentation of the subject in relation to lay matters.

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*N.s., 6: No. 2, (March) 1934.

The text is accompanied by many excellent illustrations, most of them redrawn from old cuts. There is an index, but Dr. Haggard has wisely not cumbered his book with a bibliography, which would probably have been somewhat repellent to the lay reader, and unnecessary to the scholar of the history of medicine.

A TRUTH TELLING MANUAL AND THE ART OF WORDLY WISDOM, being a collection of the aphorisms which appear in the works of Baltazar Gracian of the Company of Jesus, and Reader in Holy Scripture in the College of Tarragona, immediately translated for the understanding from a 1653 Spanish text, by Martin Fischer, doctor, and professor in the University of Cincinnati. Springfield, Ill., Charles C. Thomas, 1934.

Though this fascinating little book is not medical in character, nor even written by a teacher or practitioner of medicine, it is, nevertheless, one which it would profit any medical man to read for it is a book of wisdom dealing with human nature, and written by one who knew. Although Gracian's writings have been translated and published in English a number of times he is seldom referred to or quoted although there are few authors who lend themselves so well to quotation or whose writings contain more pithy expressions worthy of remembrance, so much so that it is impossible for the reviewer to pick out a suitable assortment for reproduction here. Gracian was a Jesuit and a most erudite humanist. His writings show such freedom of thought and liberality of views that it is not strange that his superiors relegated him to an obscure provincial post, and that some of his writings were banned. In the Introduction Dr. Fischer says of him "a thinker, a wit, a pen like a rapier," and likens him to Aristophanes, Swift and Voltaire, as being too sharp for his time. Though this is true yet Gracian's apothegms and sayings are not malicious, nor apparently does he engage in warfare against any particular institution or abuse of his time. His observations more or less at random on human nature, its weaknesses and foibles, and his satire or criticism are directed against faults which are common to all human beings. His book is not caviare to the general but will appeal to the thinking few, to those who read for mental stimulation. The publisher as well as the translator is to be thanked for the exquisite format of this little volume, so small that it can be readily slipped in the pocket, beautifully printed on excellent paper, it is exactly adapted to the purpose which it is to be hoped many will put it to, to carry as a companion on wayfarings during which its contents can be dipped into and meditated on at leisure, a real vade mecum.

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